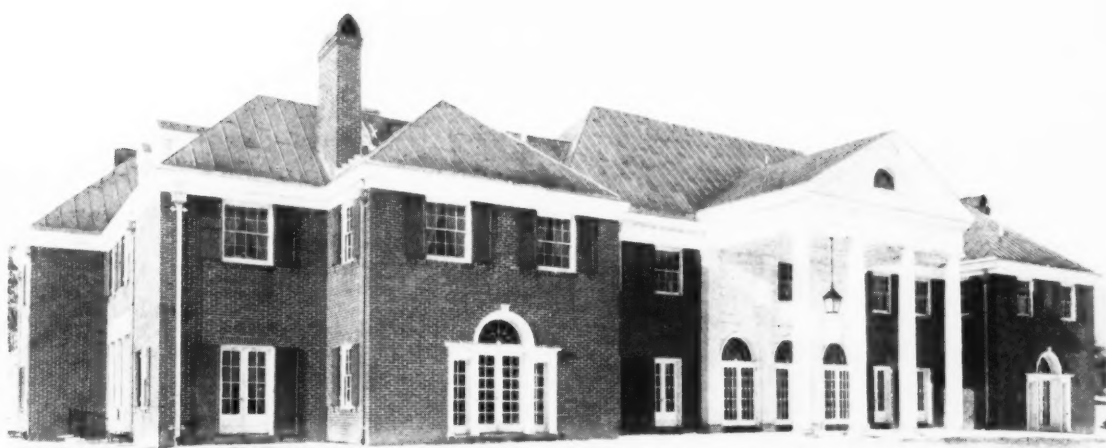


# American Artisan

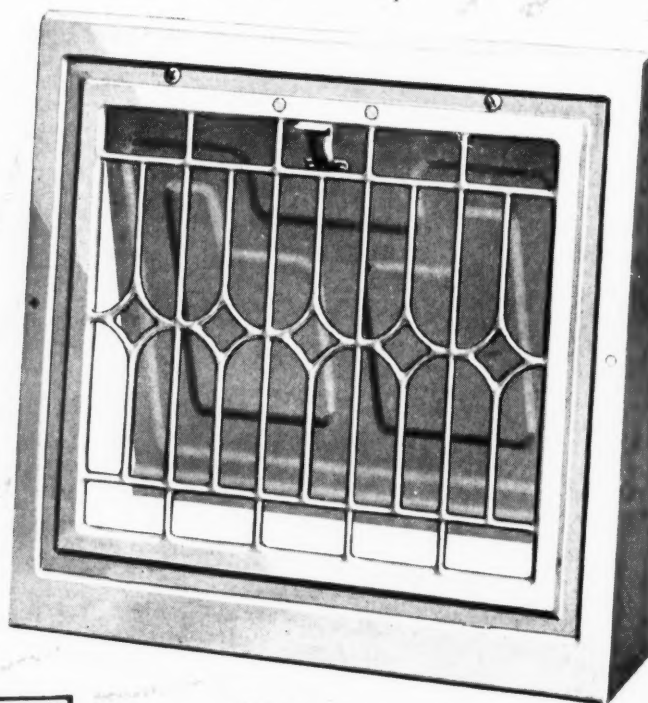
THE WARM AIR HEATING  
AND SHEET METAL JOURNAL  
FOUNDED 1880



This magnificent house, outside of Pittsburgh, is heated with a gas fired, forced warm air system. Three separate gas furnaces, each with its own trunk line and blower, were used. Full automatic control, arranged to provide summer circulation of air, directs the equipment. Full details and layouts for the system are in this issue.

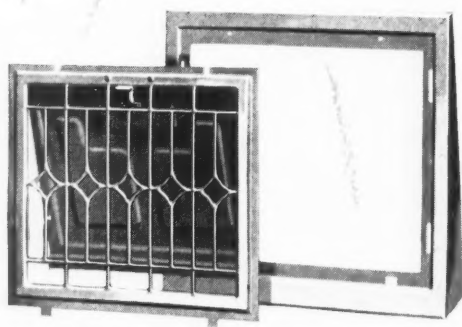
FEBRUARY 16, 1931

One Piece  
and  
Two Piece



**INDEPENDENT**

## BASEBOARD REGISTERS



2-piece with  
removable grille

**N**O MATTER how exacting your demands may be, whether for style or value, or both—look to Independent for all your register needs. You will certainly be pleased with the great variety of attractive designs, the excellent workmanship, and the splendid finishes.

Noteworthy features are; clear, sharp embossing—reinforced and welded corners—positive, smooth-working, permanent valve adjustment—convenient well-formed valve handle.

**INDEPENDENT REGISTER  
& MFG. CO.**

3741 EAST 93<sup>RD</sup> STREET • • CLEVELAND, OHIO

Febru

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CAR  
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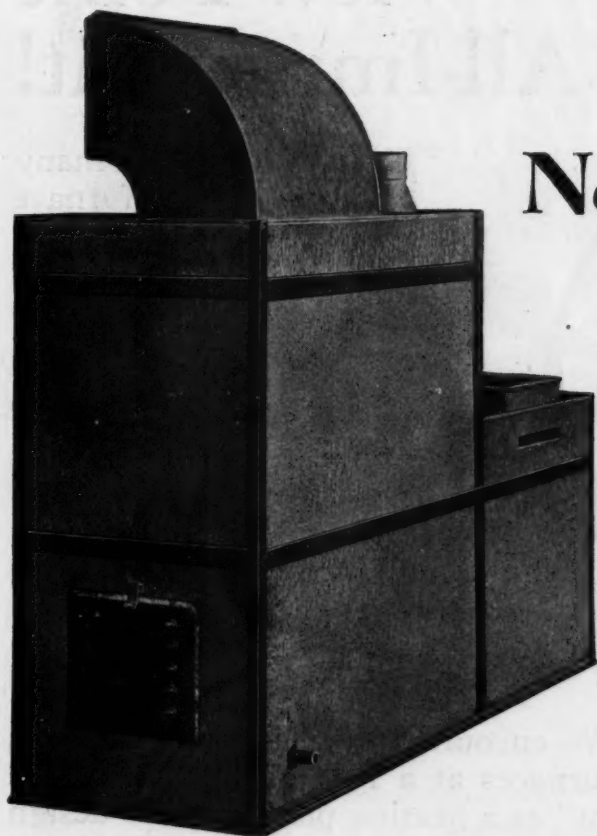
...s may be,  
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... designs,  
... finishes.

...ossing—  
... smooth-  
... convenient





# Moncrief Advances Again!



## New Gas Furnace

### Expands the Already Extensive Line

Here furnace men, is a gas furnace that is a marvel of economy and efficiency, and a delight to look upon. It is originally designed with features that insure extraordinary heating ability; and the square jacket, finished in rich apple green, makes a great appeal to the eye.

Made in three sizes and two types; for gravity circulation; and electrically equipped, full automatic, with blower, humidifier, thermostat, air filter, and all other control devices necessary for

care-free comfort and most economical operation.

It doesn't take sales ability to sell this gas furnace. It sells itself on sight, and will sell others by performance.

*Write for Literature*

## The Henry Furnace & Foundry Co.

3471 East 49th Street • Cleveland, Ohio

WE SUPPLY EVERYTHING USED  
ON A WARM AIR HEATING JOB

### *Manufacturers of*

MONCRIEF  
SERIES "C"

CAST FURNACES

NEW MONCRIEF

STEEL FURNACES

### [ DISTRIBUTORS ]

CARR SUPPLY COMPANY . . . . . Chicago, Illinois  
THE HENRY FURNACE & FOUNDRY COMPANY . . . . . Pittsburgh, Pennsylvania  
THE W. J. BURTON COMPANY . . . . . Detroit, Michigan  
FRONTIER WATER & STEAM SUPPLY COMPANY . . . . . Buffalo, New York  
MONCRIEF HEATING COMPANY . . . . . Indianapolis, Indiana  
MONCRIEF HEATING COMPANY . . . . . South Bend, Indiana  
JOHNSON FURNACE COMPANY . . . . . Kansas City, Missouri  
E. A. HIGGINS COMPANY . . . . . Omaha, Nebraska

MONCRIEF FURNACE & MANUFACTURING COMPANY . . . . . Dallas, Texas  
E. W. BURBANK SEED COMPANY . . . . . Portland, Maine  
J. F. CONANT . . . . . Railway Terminal Warehouse, Troy, New York  
SPRINGFIELD PLUMBING SUPPLY CO. . . . . Springfield, Massachusetts  
WILKES-BARRE HARDWARE & STOVE CO. . . . . Wilkes-Barre, Pennsylvania

#### *Eastern Office:*

Room 1306, 11 West 42nd Street, New York City . . . . . E. L. Garner, Manager

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—14 and 64

[VOL. 100, NO. 4—\$2.00 PER YEAR]

BUYERS' DIRECTORY—60 and 62



*Looking down on the rear of the Weir.  
Note the size of the radiator—and the  
number of rivets used. All seams are  
also arc-welded*

## View-Point is All-Important!

**T**HERE are so many angles to the furnace business!

But the one that is of heart-interest to every dealer is the PROFIT angle.

Volume-of-sales is far less important than profit—from the view-point of the dealer who is definitely concerned with making something more than a mere living and in the continuance of his business.

We encourage WEIR dealers to sell WEIR furnaces at a PROFIT. The WEIR has features that put it "out in front" as a heating plant. Better design—better materials—better construction—these things result in better performance—longer life—greater fuel economy—

And Our Weir Dealer Helps  
Definitely Aid Weir Dealers in Presenting  
the Weir Story to the Home Owners  
Who Are Beginning to Appreciate That  
"Next to the Walls and the Roof, the Furnace  
is the Most Important Part  
of the Home"

*We solicit inquiries from dealers who are seeking  
profits in 1931.*

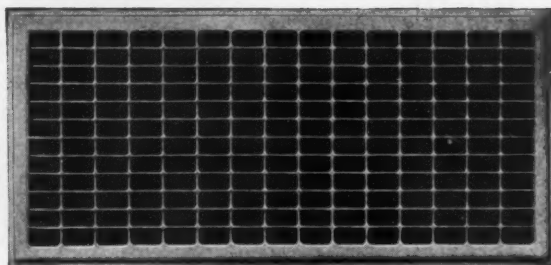
**THE MEYER FURNACE COMPANY**  
PEORIA 1 1 1 ILLINOIS

*Say you saw it in AMERICAN ARTISAN—Thank you!*

# The STANDARD OF COMPARISON SUPER-REGS

## Style "M" Cold Air Grille

With a strengthening bar that cannot slip out of place—an exclusive Super-Reg feature.



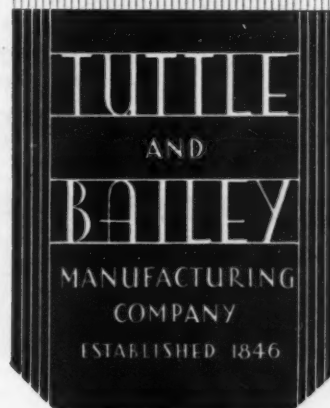
There must be some reason why "Super-Regs" have been copied so much. But the most clever imitation of design, color or even mechanical features cannot replace the underlying unvarying quality that has made Super-Regs the standard of comparison.

Baseboard registers (one or two pieces)—Side Wall registers—Floor type registers—"Cobble" Cold Air Faces . . . each has its identifying name, but all are "Super-Regs" . . . finished in many standard colors and neutral tones or in the famous exclusive T. & B. "Tanbo" finish, for harmony with interior decorative plans. All are made to satisfy the same unyielding standards of design, construction and workmanship—every one a testimonial to the leadership of Tuttle & Bailey in the industry since 1846.

**TUTTLE & BAILEY  
MANUFACTURING CO., INC.**

441 Lexington Avenue, New York City

Offices in Boston, Chicago, Kansas City, Los Angeles



*Mention AMERICAN ARTISAN in your reply—Thank you!*



# \$56

## Now Buys RIVETED STEEL CONSTRUCTION

This is an unusual furnace advertisement chiefly because we have boldly stated the wholesale price for all to read. But this announcement is justified because there are hundreds of furnace dealers who need this information—dealers who do not have the edge on their competitors and are not getting their share of the sales that are closed on a closely competitive basis. You will find that you can use this furnace to advantage—selling it at a price which your competitors cannot duplicate except with inferior quality, and at the same time making your regular margin of profit on every sale.

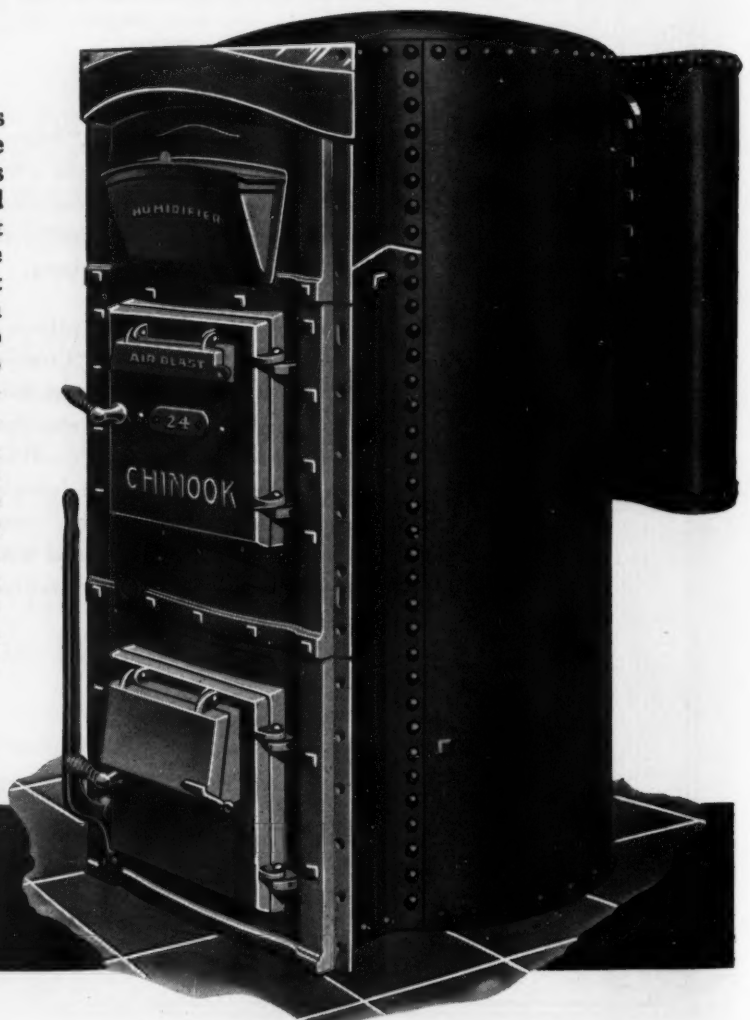
### Consider These Features

Here is **QUALITY** that is outstanding even when the price is forgotten. Here is **QUALITY** that stands head and shoulder above that found in any other furnace—cast iron or steel—that can be bought or sold at a similar price. We want to tell you more about it—to give you a detailed description of the interior construction; the brick-lined firepot, locomotive type grates, fuel-saving radiator, outside shaking device, riveted and calked seams, and the scores of other features you seldom find in a furnace at this price. Get the facts about this quality furnace for your close competition work.

**WRITE TODAY FOR  
COMPLETE INFORMATION**

MARSHALLTOWN FURNACE CO., INC.  
MARSHALLTOWN, IOWA

EASTERN FURNACE CO., INC.  
SYRACUSE, N. Y.



Say you saw it in *AMERICAN ARTISAN*—Thank you!



"You associate *permanency*  
with mausoleums, *hence*  
ANACONDA COPPER was selected,"

A. W. Bales, general manager California Cornice Works, Incorporated, Los Angeles, California.



writes A. W. BALES, Los Angeles

THE California Cornice Works, Inc., of Los Angeles, of which A. W. Bales is general manager, recently completed a unique installation for The Forest Lawn Mausoleum at Glendale, Calif. Mr. Bales says of this job:

"You associate permanency with mausoleums, hence Anaconda Copper was selected. Other factors besides durability were considered: uniform thickness, proper cornice temper, smooth and leveled sheets, all making possible an extraordinarily neat and harmonious installation. In the skylight construction 20,000 pounds of Anaconda Copper and solid Brass cores were used. The slogan for the mausoleum is '100 years from now.' The Anaconda Copper and Brass will be there to the end and there will have been no expense for repairs or upkeep."

While the average home-owner does not expect his house to last 100 years, he *is* interested in the lowest possible upkeep expense. He knows that Anaconda Copper, correctly installed by competent contractors, always proves a definite economy. Because customers are willing to pay for durable sheet metal work, more and more contractors are specializing on Anaconda Copper. The American Brass Company, General Offices: Waterbury, Connecticut.



View showing a few of the twenty skylights in which 20,000 pounds of Anaconda Copper and Brass were used.



View of a corridor in the Forest Lawn Mausoleum.



# ANACONDA COPPER

Look for the name ANACONDA in every sheet and strip. Leading Supply Houses carry it.

Mention AMERICAN ARTISAN in your reply—Thank you!

# SELL WARM AIR HEATING

SELL  
**NIAGARA'S**  
Healthful-  
Home-Heat

*It's the most satisfactory  
system money can buy.....*



**M**ORE than just warmth. Open your Niagara Warm Air Furnace Book before Mr. and Mrs. Jones, and let it help you tell them—

"Only a modern warm air heating system like the New Niagara can supply plenty of healthful, humidified heat.

"The air in the average home is actually drier than that of the Sahara desert. It dries out the throat membranes of both children and adults and makes them susceptible to colds and other sicknesses.

"The New Niagara ends this threat. It produces (1) moist, wholesome heat all day long (a minute to 'water' the big humidifier) and (2) constantly circulating, fresh air (no need to open windows to replace stale air). The New Niagara will help keep your family in better health than you've ever enjoyed before. Ask your doctor."



You are selling the **only** system, Mr. Dealer, that insures this positive health advantage—and the New Niagara represents this system at its best. Thorough engineering based upon 40 years of knowing how, makes the Niagara a sound money-maker and strengthens your reputation for quality work. Mail the coupon for the Niagara Warm Air Furnace Book.



FOREST CITY FOUNDRIES CO.  
2500 West 27th St.  
Cleveland, Ohio

Send your Niagara Warm Air Furnace Book.

THE FOREST CITY FOUNDRIES COMPANY  
2500 West 27th Street  
Cleveland, Ohio

HEALTHFUL HEAT

# NIAGARA

WARM AIR FURNACE

Say you saw it in AMERICAN ARTISAN—Thank you!

## TONCAN IRON USED FOR CONCOURSE VENTILATION



## PENNSYLVANIA RAILROAD BROAD STREET SUBURBAN STATION BLDG.

The rust and corrosion resistance of Toncan Iron, together with its workability, makes it the ideal ferrous sheet metal for ventilation service. In the concourse of the magnificent structure shown here, ninety-five tons of Toncan Iron was fabricated into the ducts. Here, as in many similar installations, this longer lasting iron is carrying warm, moisture and gas-laden air and doing a major work in promoting health and efficiency.

In homes, offices, factories and public buildings, ventilation is growing in importance. Profitable dollars can be yours if you go after this business. Let us tell you all the facts about Toncan Iron—facts which have led thousands of sheet metal workers to standardize on it for practically all classes of service. They find that it pays—and so will you.

*Full details on this long-lasting metal  
sent upon request.*

Ninety-five tons of Toncan Iron used for ventilating ducts located in the Concourse of the building. Building completed in 1930.

#### Architects

Graham, Anderson, Probst & White  
Railway Exchange Bldg.  
Chicago, Ill.

#### General Contractor—Building

James Stewart & Co.  
230 Park Ave.  
New York, N. Y.

#### General Contractor— Station Concourse

Keystone State Corp.  
Philadelphia Bank Bldg.  
Philadelphia, Penna.

#### Ventilating Contractor

Riggs, Distler Co., Inc.  
216 N. Calvert St.  
Baltimore, Md.

#### Toncan Distributor

Fable & Co., Inc.  
Philadelphia,  
Penna.

**REPUBLIC STEEL  
CORPORATION**  
GENERAL OFFICES: YOUNGSTOWN, OHIO



REGISTERED PATENT OFFICE  
**TONCAN**  
COPPER  
MOLYBDENUM  
IRON



# True Talks

with successful sheet metal men

SERIES No. 1

NUMBER 1

## FARBER FINDS MONEL METAL JOBS ARE WORTH GOING AFTER

*Progressive Rhode Island firm has won larger trade and wide reputation for skill in fabricating Monel Metal*



JOSEPH FARBER  
President and Treasurer

If you ever happen to be in Pawtucket, R. I., it will pay you to drop around and have a look at the Farber Sheet Metal & Roofing Company's modern plant in that city. Capably manned, efficiently organized, splendidly equipped, it is one of the most progressive sheet metal organizations in New England—and one of the busiest!

Here's a firm that's known scarcely a dull day since its doors were first

principals in going after Monel Metal jobs. Mr. Joseph Farber, President, and Mr. Alex Rumpler, Vice-President, have both been active in developing this profitable department of the business. Both have sensed the rising tide of Monel Metal's popularity for many types of industrial equipment. They have been quick to seize this opportunity to couple their broad experience

have been particularly successful in fabricating Monel Metal units for dyehouse service in prominent New England textile mills.

Whenever this company sees a genuine need for Monel Metal they have no hesitancy in recommending this modern equipment. Monel Metal's remarkable properties of rust-immunity, corrosion-resistance, easy cleanability, steel-like strength and lasting attractiveness give Farber's bids a big edge in competition with ordinary materials—even with customers whose pencils are always sharpened!



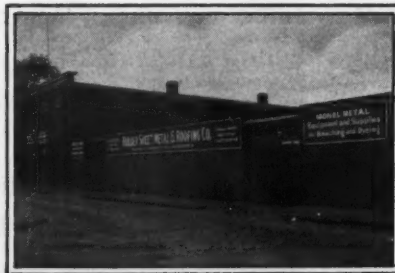
ALEX RUMPLER  
Vice-President and Secretary



These Monel Metal velvet dyeing reels typify the kind of work that is bringing Farber big profits

opened. All day long the sound of sheet metal activity plays a cheerful tune of fine craftsmanship, aggressive selling and mounting profits.

No small measure of the Farber Company's rise to prominence in the sheet metal field is due to the foresight and aggressiveness of its



Sheet metal shop and warehouse of Farber Sheet Metal & Roofing Co., Pawtucket, R. I.

with Monel Metal's advantages and adaptability to the many types of equipment that can be made in their shop.

Today the Farber Company has many notable (and profitable) installations to its credit. They

Send for pamphlet "Good Business Waiting to be Found."



Battery of heavy gauge self-supporting Monel Metal dye tanks as fabricated by Farber

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

A HIGH NICKEL ALLOY

**MONEL METAL**  
NICKEL ALLOYS LOOK BETTER LONGER



THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

Say you saw it in AMERICAN ARTISAN—Thank you!





## COMMON BUYING OBJECTIONS *and how* SUNBEAM *dealers overcome them*

***“It’s an old house  
and I don’t want to  
spend much money”***

Sunbeam Dealer: “You need not spend much money. And don’t touch your savings. Pay me so many dollars a month—that’s the Sunbeam non-profit financing plan—only five or six dollars a month more than you will pay for a cheap heating system. Savings in fuel will actually reduce the amount of your payments. If you want to sell, you can point to this furnace, built by the world’s largest makers of heating equipment, as one of the reasons why your home is an especially good value.”

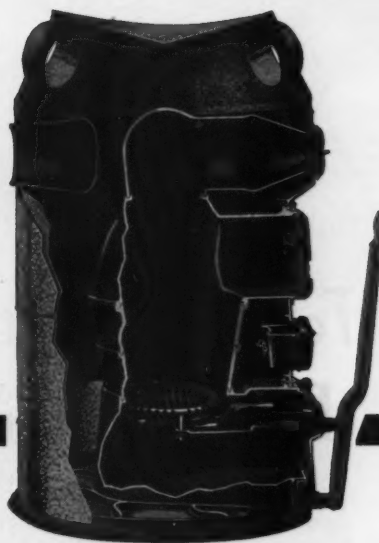
Sunbeam’s close study of furnace retailing makes this organization familiar with the fact that it takes more than a quality furnace to overcome the score of common objections that are generally raised by prospective buyers. As a result, the Sunbeam Dealer Proposition includes everything you need to overcome buying resistance.

If you are losing a profitable sale every week or every month, don’t be resigned or accept these losses as the fortunes of business. Get the Sunbeam 1931 Proposition, which the coupon below will bring to you.

### THE FOX FURNACE COMPANY

A Division of  
American Radiator & Standard Sanitary Corporation

Elyria, Ohio



Cast iron or steel  
—there is a Sun-  
beam Furnace  
for every re-  
quirement.

### WHAT OBJECTIONS DO YOU HEAR MOST FREQUENTLY?

*“I won’t order until fall when I’ll need heat.”*

Sunbeam Furnaces for replacement are sold from March to August with the first payment not due until September.

*“I never heard of your furnace or the company that makes it.”*

Sunbeam Furnaces are built and guaranteed by the world’s largest makers of heating equipment, with more than 40 years of manufacturing experience.

*“I am not a heating man, how do I know that your furnace is better?”*

Sunbeam Dealers have available a Miniature Aluminum Furnace, an exact replica of the 1000 series heating plant. Part by part they can show the prospect, his family, right in their own living room, the difference in furnaces and the numerous superiorities of the Sunbeam.

*When you return the coupon, tell us the objections that deprive you of most sales. We would like to give you the Sunbeam dealer’s answer*

### The Fox Furnace Company, Elyria, Ohio

Please send your 1931 Proposition and a copy of your 40-page Manual.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY AND STATE \_\_\_\_\_

A-3

Mention AMERICAN ARTISAN in your reply—Thank you!

# WHY ADVERTISE COPPER ALLOY?

*An Inland Metallurgist putting a copper ingot of carefully checked weight into the open-hearth furnace . . . to make Inland Copper Alloy Steel. The copper completely dissolves in the molten steel and is distributed evenly throughout the "beat."*

## . . . To benefit the users of steel

**I**NLAND is not the only company producing copper-bearing steel. In view of that fact, we are often asked: "Why do you spend so much money advertising Inland Copper Alloy Steel?"

Our answer is simply this: We maintain that its

superior resistance to corrosion and the greater economy of Copper Alloy Steel make it of paramount importance to industry, to every user of steel . . . especially since the advantages of Copper Alloy Steel can be secured at very little added cost above ordinary commercial steel.

The value of copper in steel is not as widely known as we believe it should be . . . and we are attempting through our advertising to acquaint steel users more fully with this important information.

### What the A.S.T.M. says of copper- bearing steel

Referring to tests held by them, the American Society for Testing Materials reports—"that Copper-Bearing metal shows marked superiority in rust resistance compared to non-copper bearing metal of substantially the same general composition under atmospheric exposure."



## INLAND STEEL COMPANY

ABLE SERVANT OF  THE CENTRAL WEST

38 SOUTH DEARBORN STREET, CHICAGO

Sheets   Bars   Bands   Plates   Structurals   Rails   Track Accessories   Rivets   Billets

*Say you saw it in AMERICAN ARTISAN—Thank you!*

# Agricola

## "SUPREME"

### Sets the Pace for Quick Installations

Speedy and trouble-proof installations insure increased dealer profits. Agricola "Supreme" was designed for fast and easy assembling. Installation time is reduced from 25% to 35%. This is made possible by the one-piece construction of the base, ash-pit and radiator sections; the panel fronts which slip over these other sections and which require no bolts or cement.

#### We Invite Comparison

Each size of AGRICOLA "Supreme" has a greater heating capacity. For example: The 24-inch size has a rating of 645 square inches (Standard Code Rating).

*No other furnace has  
as many advantages  
as AGRICOLA  
"Supreme"*

Write or wire for details!

**AGRICOLA FURNACE CO., INC.**  
GADSDEN, ALABAMA  
*Offices in Principal Cities*



*Mention AMERICAN ARTISAN in your reply—Thank you!*



Founded 1880

# American Artisan

THE WARM AIR HEATING  
AND SHEET METAL JOURNALCovering All Activities  
INGravity Warm Air Heating  
Forced Warm Air Heating  
Sheet Metal Contracting  
Air Conditioning  
Industrial Roofing  
Merchandising  
Ventilating

If you don't get to read another thing all this month (even the Saturday Evening Post), be sure to read about the gas furnace, forced, warm air heating plant built in Pittsburgh by B. L. Schwartz. The mere size of the job makes its details worth reading about. Here is the kind of a job a whole lot of you fellows are going to be doing before many years.

\* \* \*

One of the best bookkeeping articles yet published appears in this issue. It is written by a contractor and the figures he gives are from experience. They are worth study.

VOL. 100, NO. 4

FEBRUARY 16, 1931

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JOSEPH D. WILDER

Editor

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Howard H. Bede, Secretary

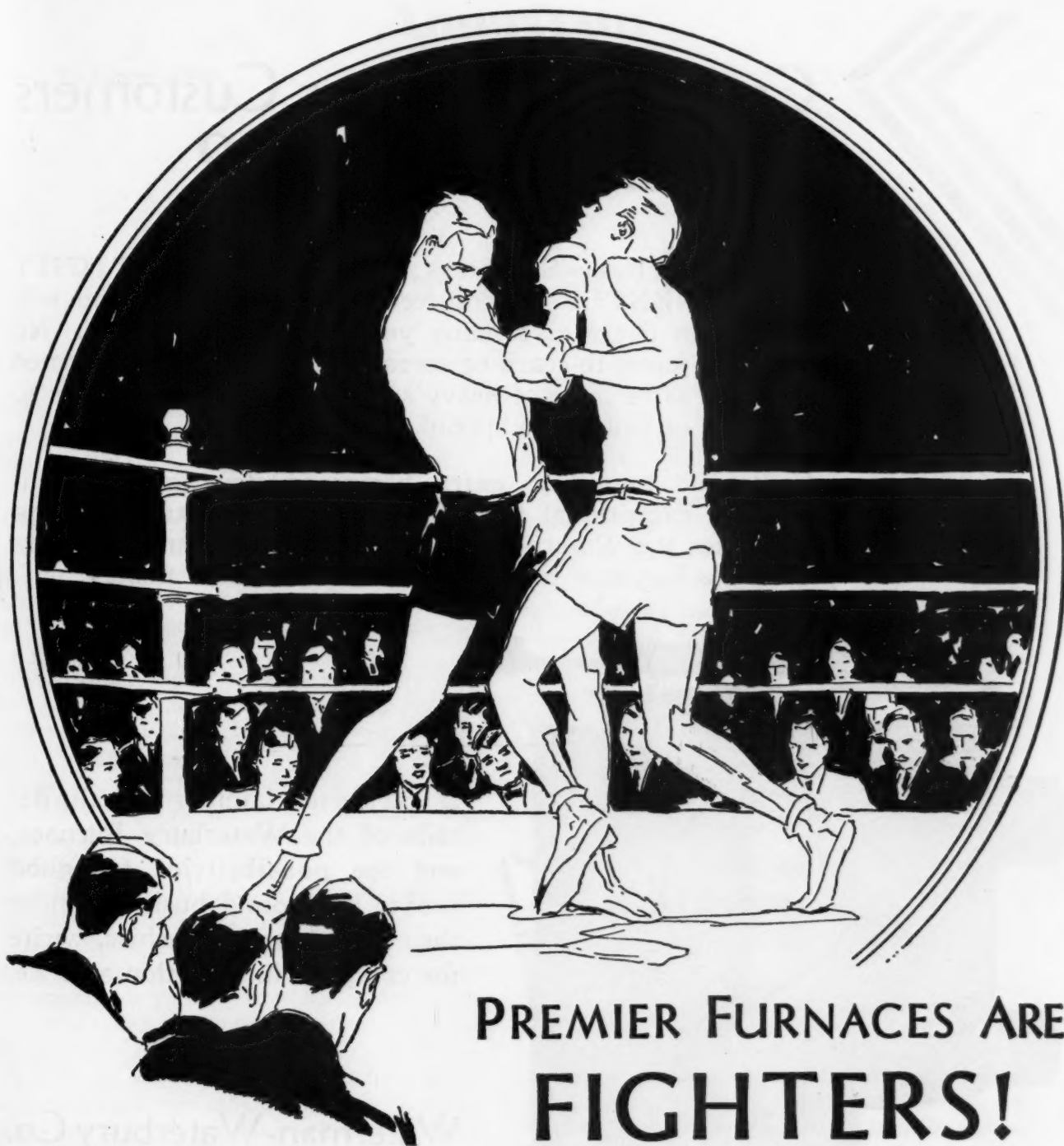
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## PREMIER FURNACES ARE FIGHTERS!

### THE PREMIER LINE

—is a Complete Line. Premier DeLuxe, the cast Premier, Premier Duo-WELD, the steel Premier, round and square casings, automatic humidifiers, registers and fittings, fans, filters and controls—everything needed for any warm air heating installation. Write for complete descriptive matter. No obligation—no personal call.

**PREMIER**  
**WARM AIR HEATER CO.**  
 DOWAGIAC + + MICHIGAN

C-R-A-C-K! Right on the chin! Who doesn't admire the man who can take it . . . like it . . . and come back for more! It's the same way about furnaces. And that's why Premier Dealers are so loyal . . . Premiers standing up where the standing up is toughest, taking it on the chin year after year and always COMING BACK FOR MORE. Premier furnaces are fighting furnaces, made by a young and fast stepping organization and sold to live and aggressive dealers. If you are a fighter on your way up the ladder and want a fighting outfit by your side, we'd like to show you our record and how we can help you. Write, wire or phone for action.

Mention AMERICAN ARTISAN in your reply—Thank you!



## Can You Offer Your Customers A Guarantee Like This?

The Waterbury Seamless Furnace is **GAS-TIGHT PERMANENTLY**—guaranteed so for ten years, and will more than likely give many years additional service. No seams or joints to crack or spread—even the front is formed from the same piece of heavy steel as the body. No bolts to shear off or calking to spread.

Controlled humidity, extra heavy construction throughout and exceptional fuel efficiency are also strong selling points for the Waterbury, bound to impress your customers with the fact that they will get more for their money.



If you are not familiar with the details of the Waterbury Furnace, and the possibilities for good profits and sound business under the Waterbury Franchise, write for complete information at once.

### Waterman-Waterbury Co.

1122 Jackson St. N.E. Minneapolis, Minn.

*Complete stock carried in*

Philadelphia  
Pittsburgh

Yakima  
Chicago

San Francisco  
Kansas City

# WATERBURY

## ALL-STEEL SEAMLESS FURNACE

*Say you saw it in AMERICAN ARTISAN—Thank you!*

## Guaranteed Fan Ratings

**G**A. VOORHEES said at the Columbus meeting of the National Warm Air Heating Association that what heating contractors needed was fan ratings against static pressures and not ratings as of free air delivery.

No doubt free air delivery ratings are the cheapest and quickest way to assign sizes to fans. But so far as the contractor is concerned, such ratings are only sources of trouble. Any manufacturer should be willing to back his product with guaranteed facts, and must if he hopes to enjoy contractors' confidence.

And attention should be called to another practice which has worked infinite harm. That practice is the rating of a fan so that it just surpasses the fan of the competitor.

These two evils have resulted in more trouble and more expense for the heating contractor than any two other factors in present-day forced air installation.

It might be well if every fan manufacturer had to install one of his fans against competition. Being a competitive job, it is not possible to install a greatly oversized fan and still get the job. So the contractor has to put in a fan which is rated so and so. If that rating is all right the system works as intended, but if the fan is rated too high, it will not deliver the air, and the contractor is in for a never-ending series of service calls which end in his taking out the fan and spending his profit in installing a larger size.

The insidious thing about this situation is that the contractor never knows when he is getting a large enough fan, and eventually he either loses jobs by bidding on too large a fan or he becomes disgusted and switches to another make of fan.

It might also be said that free air delivery has no place in the type of forced air systems our contractors are now being called upon to figure. We refer to the large sized house, with from 10 rooms to 30 rooms. In such houses the trunk line system always has some resistance. Runs may be long, or they may be crooked, or part of the trunk may be through tile ducts under ground, or across ceilings in restricted spaces.

The result is that there is a very decided static resistance which must be overcome before the forced air system can be made to work. Substituting larger sized fans for the one originally installed is not a cure—it is simply a profit destroyer.

What the contractor doing that kind of work has to have is a fan which is *guaranteed* to deliver so much air *against* stated resistances.

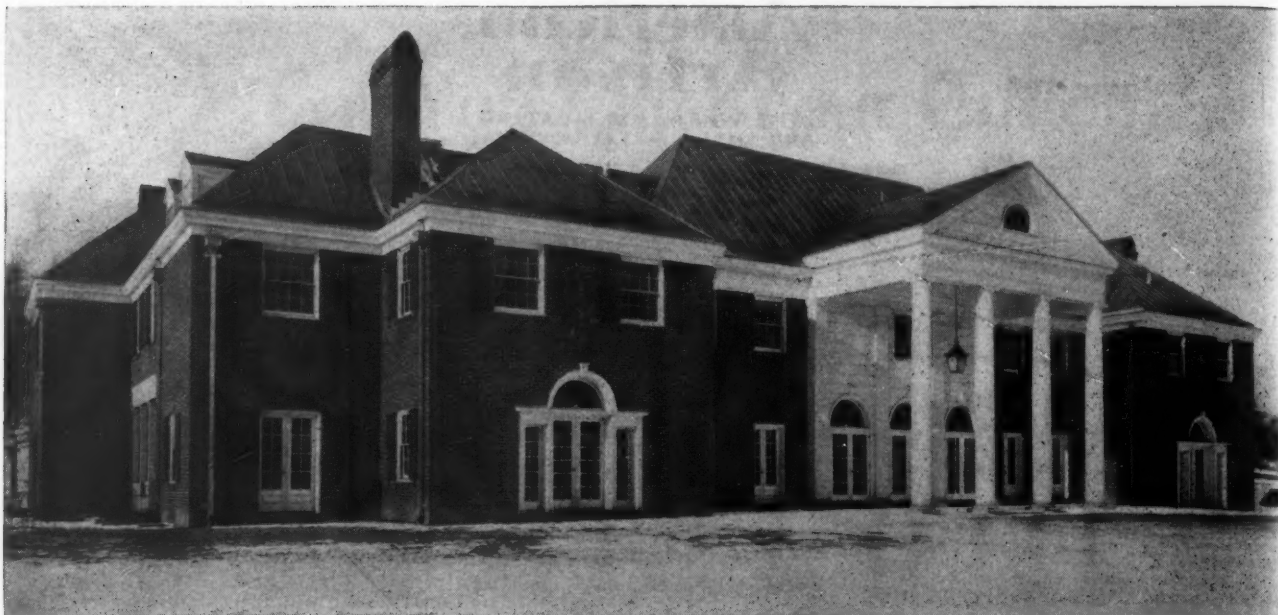
There is no doubt but that the situation came about because fans in heating are comparatively in their infancy. Almost out of a clear sky contractors began to get orders for forced air installations. They had to have fans, and the old-line manufacturers had not bothered to build sizes small enough for house work. As a result a flood of fan manufacturers came into existence whose sole purpose was to build and sell as many fans as possible while the boom was on.

These manufacturers did not have time to, and indeed would not if they could, stop and rate their fans scientifically. They had a market and their sole worry was sale and production. The result was that fans bloomed overnight and each manufacturer rated his fan above that of his competitor in order to get business.

The remarkable thing is that in spite of such helter-skelter practice, forced air installations have continued to increase in popularity. Larger and larger structures have turned to forced, conditioned air as ideal for heating and cooling. More and more such jobs may be expected. Regardless of how essential guaranteed ratings against static pressures are now, such ratings will be even *more* essential within a short time.

The bright spot in the picture is that the situation has been analyzed by some of the manufacturers and we may shortly expect to see guaranteed ratings against static pressures adopted by all the important fan manufacturers. The time when this is done cannot come too soon, for every month sees additional contractors doing the kind of jobs where ratings are required, and if our industry expects to ride the wave of popularity of forced air we must be able to deliver just what we say we can do.





This is the exterior of the huge house. It is heated by one of the largest house warm air jobs built last year

## This Three Furnace, Forced Air System Sold for \$7,700!

**T**HIS is the story of a private home warm air heating system which sold for \$7,700.

That's a lot of money for a school, church or commercial structure heating plant, but this is in a house and it's warm air.

The installation is the work of B. L. Schwartz of Pittsburgh, whose excellent jobs have been reported from time to time. The price includes three gas furnaces, each with its own dust system, blower, and control.

The house is a three-story structure, 125 feet long, 64 feet wide, and is "all house." Because of the large interior area, it was necessary to use three complete gas-fired systems to heat the house. The basement plan shows the layout of these three systems. Two of them are quite large, while the third is used for a large living room and two bedrooms on the second floor. It was the owner's original intention to use only two main systems

and install the third one at a later date, but this did not prove feasible, so all three systems were installed.

There are many features in the plan prepared by the Schwartz Company. Due to the large exterior area, it was necessary to calculate very closely the heat losses and effect of wind and exposure. The weather reports over a period of years show that zero degree could safely be counted as a minimum, and the interior temperature desired was 68 degrees at a body height of three feet above the floor.

Because of the rectangular shape of the house, the three heating systems are laid out so that each functions mainly as a straight flow system using one main duct with branches.

Quite a large area of the basement is unexcavated, and it was necessary, therefore, to carry some of the duct work through spaces which were just deep enough to take the duct.

All heat losses were figured on a B.t.u. basis. Without going into detail, 175,000 B.t.u.'s were figured for the first floor, 159,000 B.t.u.'s for the second floor, and 73,000 B.t.u.'s for the third floor, making a total heat loss of 407,000 B.t.u. per hour.

It is quite interesting to analyze the design of the three heating systems in the basement. The first system is used to heat the dining room, breakfast room and service quarters on the first floor and the study and four bedrooms on the second floor. One No. 60 Bryant gas furnace with a rated capacity of 211,200 B.t.u. furnishes heat for this system. Two main warm air ducts of rectangular shape and two smaller mains comprise the duct work. One large duct, 56x14 inches, was taken off the top of the furnace as shown in one of the drawings. This main duct is carried practically the entire depth of the house, with branches at various points and



connecting to first floor registers and second floor stacks.

This gas furnace has its own blower, which is a Miles blower with louvers for gravity flow.

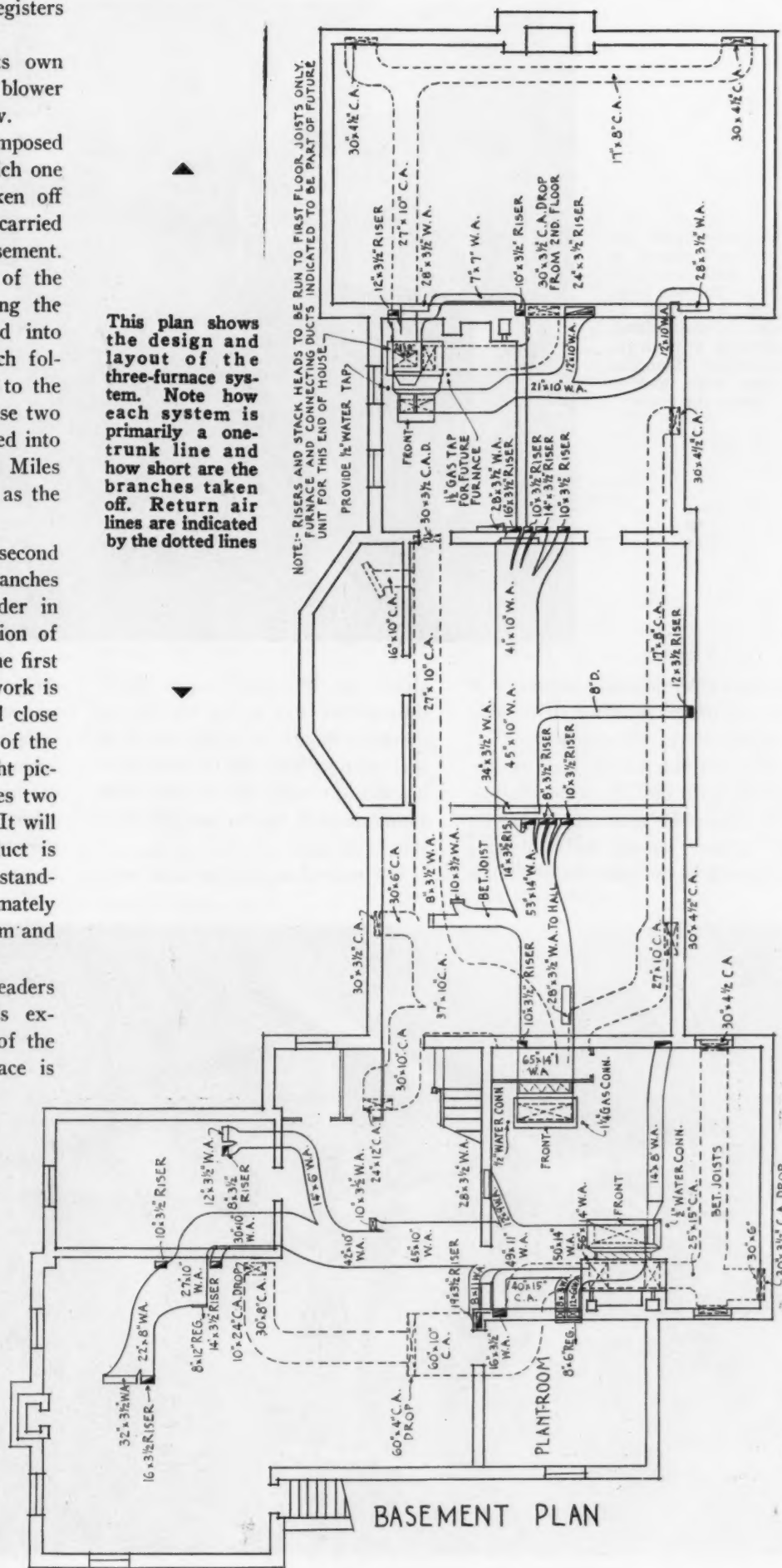
The central system is composed of a large single unit in which one large warm air main is taken off the top of the furnace and carried down the floor of the basement. Cold air from this portion of the house is brought down along the outside walls and connected into two return air systems which follow the exterior walls back to the furnace room partition. These two return air mains are connected into a housing holding a second Miles blower of the same capacity as the first.

The main feature of this second system is the fact that all branches are taken off the main leader in two groups, with the exception of one small warm air run to the first floor hall. All of this duct work is rectangular and is suspended close to the first floor joists. One of the photographs shows a flashlight picture of this main as it crosses two large soft water filter tanks. It will be noticed that this large duct is braced for rigidity by locked standing seams placed at approximately 4-foot centers along the bottom and sides.

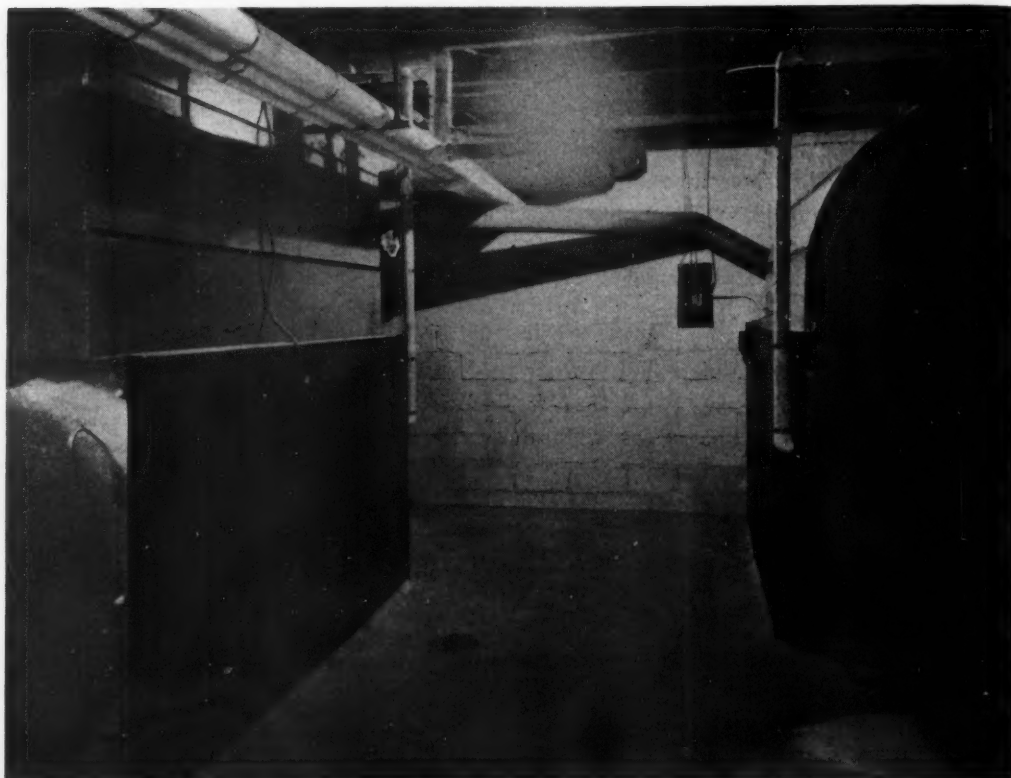
One of the return air leaders from this second system is extended into the end portion of the house where the third furnace is located. This return was provided so that if the third system was not installed, adequate circulation would be maintained inside this end area.

The third system is much smaller than the other two, and has one large duct and one small one taken off opposite sides of the furnace. The large duct is used to heat the adjoining garage and the first and second floors. The return air side of this furnace has one stack from the second floor and one long return passing

This plan shows the design and layout of the three-furnace system. Note how each system is primarily a one-trunk line and how short are the branches taken off. Return air lines are indicated by the dotted lines



The two largest furnaces are placed in one small furnace room. The one large trunk is carried up high to the ceiling, effecting a plenum chamber. Standing seams were used to brace the ducts



through the unexcavated portion at the end of the building. This long run also serves the second floor.

Another interesting fact in connection with this job is the thermostat controlling apparatus. That for the furnace serving the right wing is located in the main hall. This is

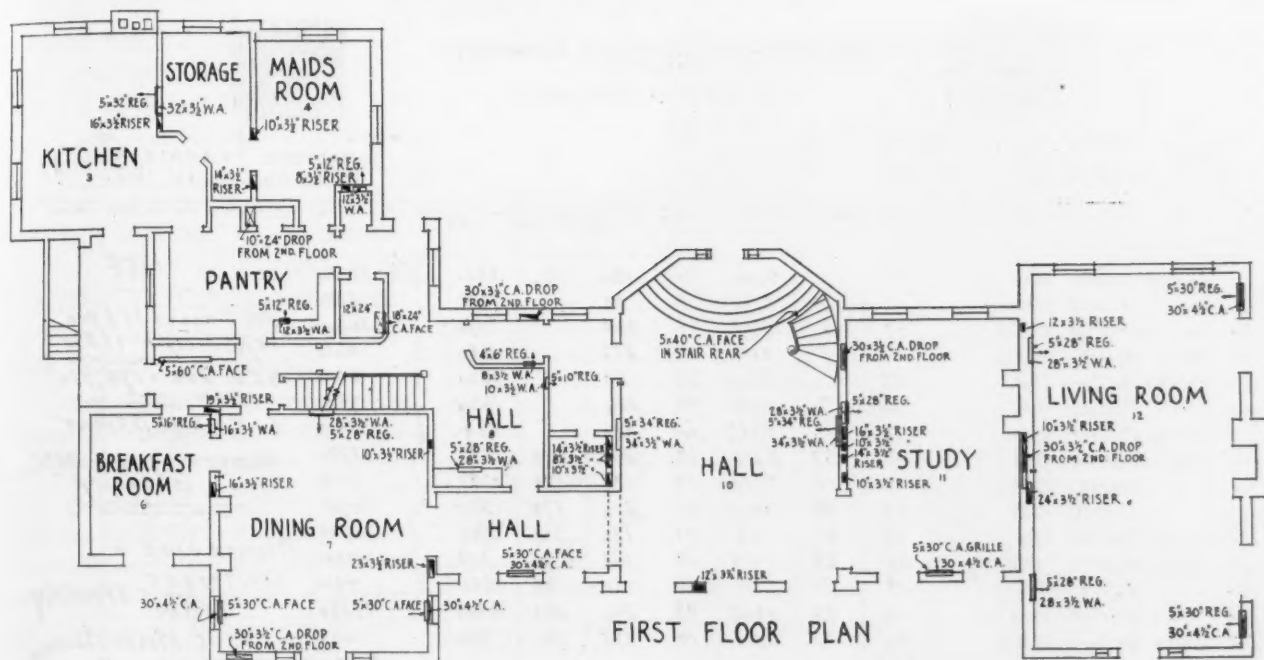
above the basement room shown through the door at the far end of the tank room. It is also wired in such manner that the furnace serving the left wing can be controlled simultaneously by the same thermostat, if desired.

For individual operation, a sepa-

rate thermostat is located in the second floor hall towards the left wing. This controls the furnace serving this wing. Then if one side of the house cools faster than the other, due to wind direction, sunshine, etc., that particular unit operates to offset the heat loss.



The "tank room" view shows the magnitude of some of the overhead runs. The extreme left-hand duct is return air, the warm air duct running parallel to it on the immediate right. These carry over fifty feet in length. These ducts are not covered although no heat is provided to offset the heat loss. The painted finish can hardly be classed as insulation, yet the air temperatures carried are so low that radiation heat losses are insignificant



A three way knife switch permits either simultaneous or individual operation. It is significant to note that the system is so well balanced that both units are ordinarily controlled from the main hall thermostat only. It is expected that the individual controls will be used should it be desired to maintain a higher temperature in the left wing in cases of sickness, etc.

In designing the system, Mr. Schwartz aimed for a velocity of 300 feet per minute through all the basement ducts and a velocity of

400 feet per minute in all the stacks to the second and third floors. The register temperature was set at 138 degrees and with the air filtration it was calculated that the return air would reach the furnaces at a temperature of 63 degrees F.

This gives a temperature difference of 75 degrees.

In calculating the heat requirements the following factors and formulas were used:

Each system was designed separately and two register temperatures were used. To the heat loss of each system 10 per cent was added for safety. The factor for heat loss of glass area is 1.1, for the wall loss .25, for ceiling or floor .20, and for infiltration .02. The temperature difference used

was 75 degrees. Multiplying areas by factors times temperature use gives the B.t.u. loss of each room.

The formula for the fan is  
heat loss  $\times$  55

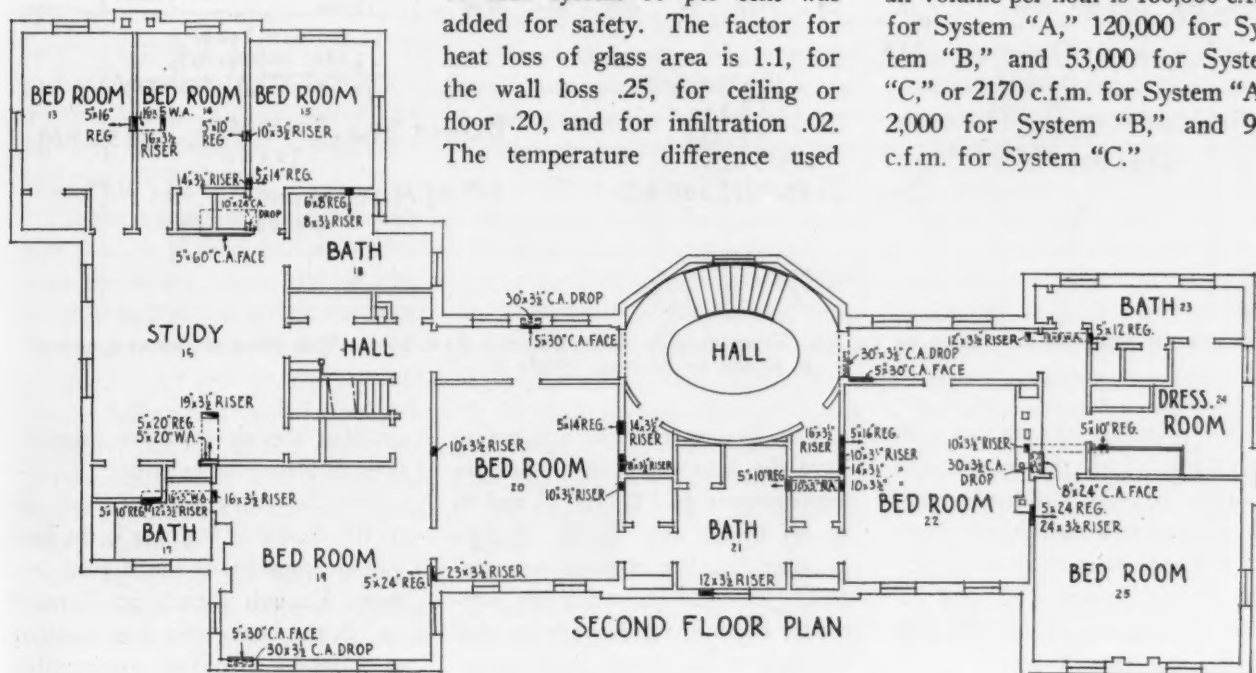
temp. difference  $\times$  60 min. in 1 hr.

The 55 is the number of B.t.u.'s needed to raise one cubic foot of air one degree.

All these calculations are shown on the data sheet

Using the formula 
$$\frac{\text{B.t.u.} \times 55}{\text{Temp. loss}} =$$

cubic feet of air, we find that the air volume per hour is 130,000 c.f.h. for System "A," 120,000 for System "B," and 53,000 for System "C," or 2170 c.f.m. for System "A," 2,000 for System "B," and 900 c.f.m. for System "C."







of heat flow via gravity operation, long after gas and blower are both shut off by the controls. This eliminates any overheating which would occur should the blowers continue to function after the gas is automatically shut off. In like manner, no cool air can be delivered at the registers, as the blowers cannot come on until the casing temperature reaches 130 degrees F.

There are many interesting features of design throughout the rooms of the first and second floors. For instance, in the large entrance hall on the first floor, heat is introduced through two 20x12-inch floor registers located on opposite sides of the room. Return air is provided for by a grille set vertically in the wall of the circular staircase. This vertical grille connects with a 28x4-inch stack in the partition wall and through this to the side wall return air main of the central system. The hall has a cubical content of more than 11,500 cubic feet and requires 235 square inches of warm air piping. The B.t.u. loss of this room is 40,510.

Connecting with this hall is a large study with a cubical content of 4,000 feet. The heat losses on this room, where there are two exterior walls, is more than 16,500 B.t.u.; 98 square inches of warm air piping is required. Only one cold air face is provided for this room and that is against the exterior wall between two large French doors. Warm air is introduced through one 14x14-inch baseboard register.

On the other side of the entrance hall there is a short hall connected with the dining room, and off this another hall which serves the service quarters. These rooms are all small size and without any unusual design features. It will be noticed, however, that all of the return air is taken care of by floor grilles and warm air introduced through baseboard registers.

At the end of the house, served by the first and largest heating plant, the dining room is the largest room of the group. The exposure

Bright tin stacks for warm air and shop-built galvanized iron stacks for return air were used. The walls throughout the house are clay tile and the stacks be embedded in the false plaster surfaces



of this room is not very great and one 16x12-inch register supplies warm air. The return air is taken out along the outside wall.

All of the rooms in the service section are small and without any unusual features.

The smallest of the three heating systems is located under the large living room which extends the full depth of the house. This living room has a cubical content of 7,500 feet and requires 187 square inches of warm air leader. The B.t.u. loss on this room exceeds 31,000 B.t.u. It is easy to see, therefore, why one separate system was planned for this part of the house.

In this room warm air is introduced in the two inside corners through floor registers. Return air is taken out of the two outside corners through the long main passing through the unexcavated portion.

There is nothing of unusual design on the second floor except that in several instances it was necessary to bring the stacks up through one partition of the first floor and connect by floor ducts with registers located in another partition.

In most of the rooms, warm air is introduced through baseboard registers on inside walls and return air is taken out along outside walls. In one case warm air had to be taken up through the outside wall, and this stack was heavily insulated to eliminate heat loss. All of the large rooms on this floor have both warm air and return air provision. With the forced air system there will be a constant circulation of air throughout all of these larger rooms.

The small rooms are not equipped with return air, but each of the  
(Continued on page 47)

# Copper Cupola and Heavy Cornice Used On Toledo Public Building

THERE has just recently been completed in Toledo, Ohio, a new home for the Fire and Police Alarm department which entails in its construction a number of interesting details worked out in copper.

The building was designed by Langdon, Hohly and Grim, Toledo architects. The sheet metal contractor for the work was the Fred Christen and Sons Company, also of Toledo.

The most interesting feature of the metal contract is the large cupola which rides the ridge of the main wing of the building. In addition to the cupola there is a large amount of copper in the cornices and gutters and in the flashing for the tile roof.

The handsome building is of brick and stone with the stone around the high basement floor and around the top of the wall. The eave is composed of a heavy copper cornice with a good projection.

The roof is of slate. The building is of severe design and depends upon the copper cupola for ornamentation.

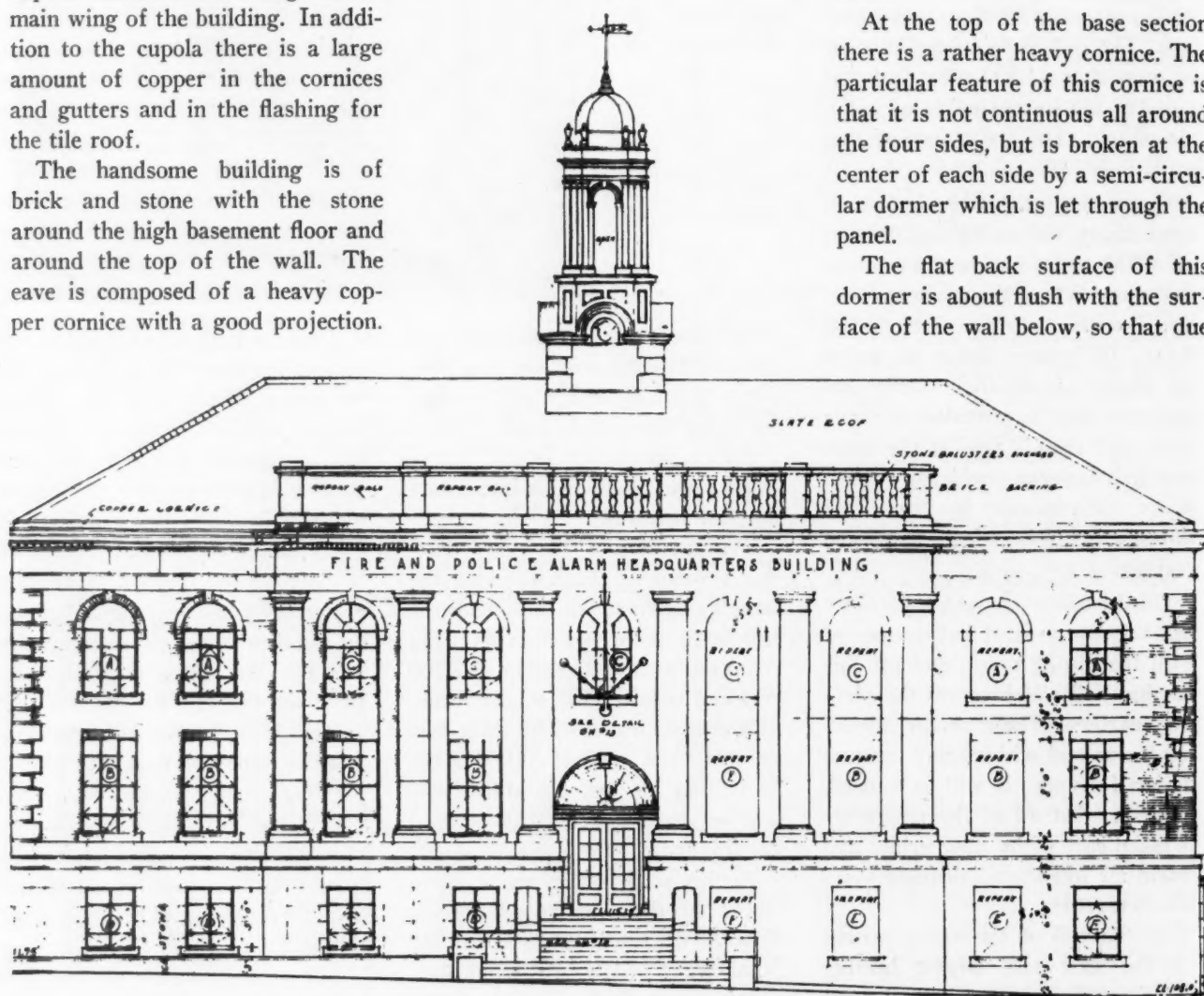
There are a number of interesting details to the copper cupola. The base of the cupola straddling the ridge of the main wing is square and designed to have flat surfaces throughout the center of each side with quoins at the corners. In working out these quoin corners the contractor made each corner of as large a piece of metal as possible. One of the photographs

shows one of these corner sheets after forming. Three quoin stones were formed into each sheet leaving enough metal top, bottom and edge to seam with adjoining sheets. All seams in each section were soldered in the shop. These sections facilitated erection.

There is nothing out of the ordinary about the flat panels in the center of each base elevation. The roof flashing is of the flat exterior type made a part of the base sheet and extending down over the top row of slate with a turned under seam.

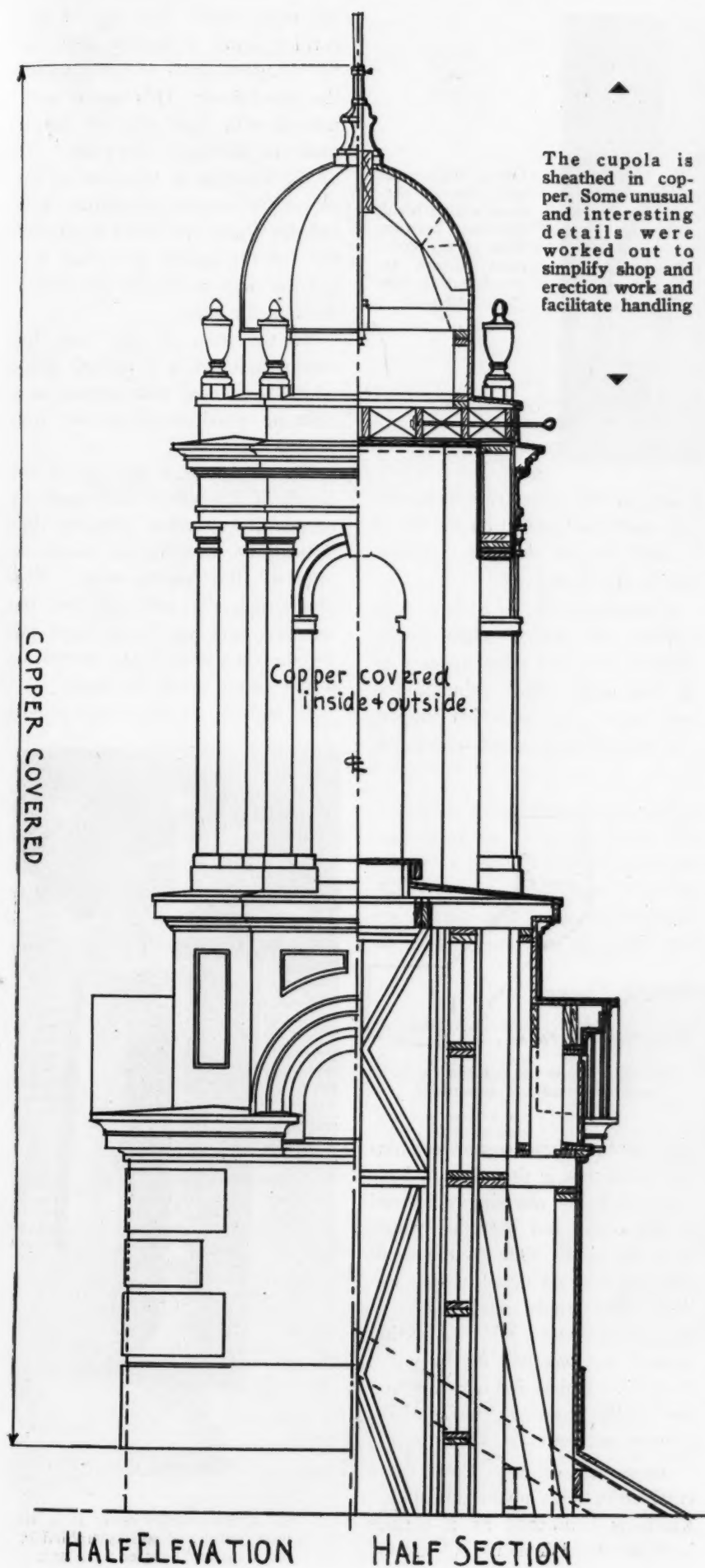
At the top of the base section there is a rather heavy cornice. The particular feature of this cornice is that it is not continuous all around the four sides, but is broken at the center of each side by a semi-circular dormer which is let through the panel.

The flat back surface of this dormer is about flush with the surface of the wall below, so that due



This is the architect's scale drawing of the building. The copper cupola and cornice make the ornamentation





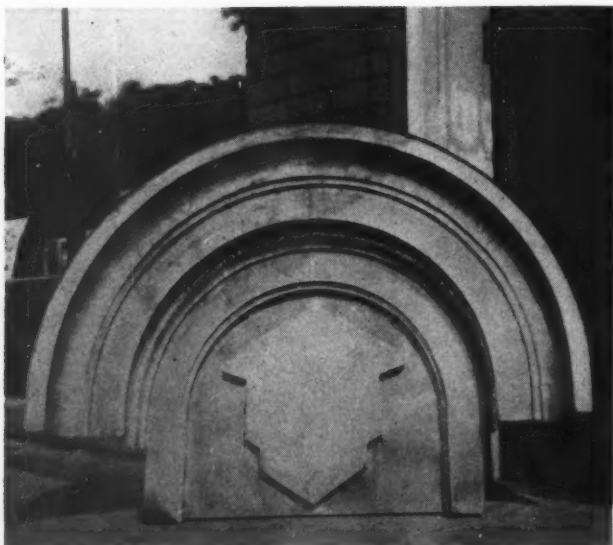
Here is a section of the quoin stone corner of the base. The assembled section was soldered in the shop and erected as a unit

to the construction of the dormer, the top of the arch projects about 8 inches out from the vertical of the base section.

One of the photographs shows one of the dormers assembled at the shop and ready for installation on the job. A cross section would show a series of five projections out from the back surface. The emblem on the back surface is a blockhouse.

There is one of these dormers on each elevation of the cupola. The dormers are set in a pedestal section which is paneled for appearance. As worked out in the sheet metal shop, the pedestal section is composed of a corner panel with a slight projection and a  $\frac{3}{4}$ -inch depressed panel alternating with a pair of depressed central panels also depressed  $\frac{3}{4}$  of an inch.

Above this panel section there is a second cornice some 8 inches high and with approximately a 6-inch projection. This cornice serves as the base of the copper covered deck which is flat locked and soldered. This column section is open from side to side and had to be made weather tight by permanently closing every seam. There



▲  
One of the assembled dormer sections which break the lower corners. This is the complete section assembled in the shop  
▼

is an inside scuttle in this section to permit exit to the dome for any repair work or cleaning. This scuttle is copper covered.

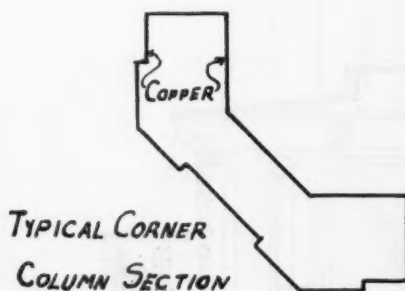
One of the unusual features of the cupola occurs in the column section. It can be seen from the drawing that this section is composed primarily of four solid corner sections open through the tower both ways at the center lines. The drawings do not indicate the height of this section, but it is just

8 feet, so that an entire column section could be handled on the job if it could be put together economically in the shop.

Accordingly a section was worked out which when finally soldered contains what appears to be four large corner columns and two lower columns which support the semi-circular capstone of the



One of the column sections consisting of two high and two low columns with a complete sketch. See sketch for details



This shows how the column section was designed and assembled

open arch. These corner columns are false, that is they do not have four sides, but are simply formed as depressed and extruded panels of a flat sheet. One of the small sketches shows a detail of this section. The whole section is self supporting and self protecting against the weather by having a back side which follows the contour of the front or exterior of the column section.

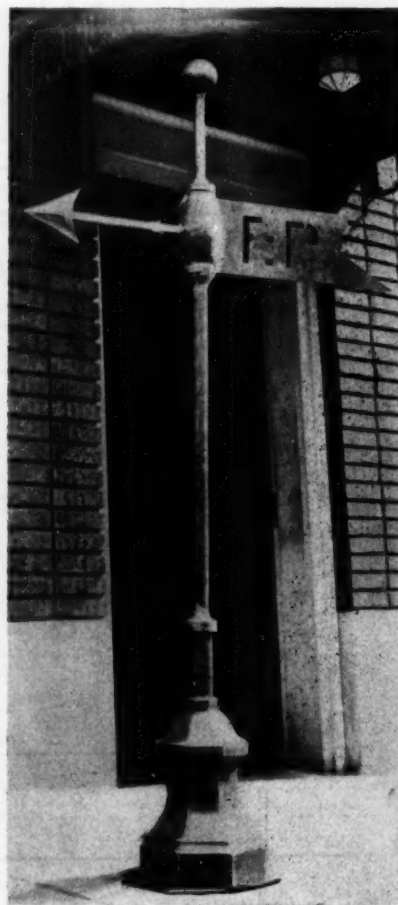
Above the columns there is an entablature with no ornamentation which is contoured as a cornice built on wood lookouts all around

the eight sides. The top of this cornice forms a shallow deck for the octagonal base which supports the round dome. This base is ornamented with eight urns of copper made as standard stampings. All of the covering at this part of the cupola is copper, of course with suitable seams and locks as worked out for the easiest and most economical way to handle the details through the shop.

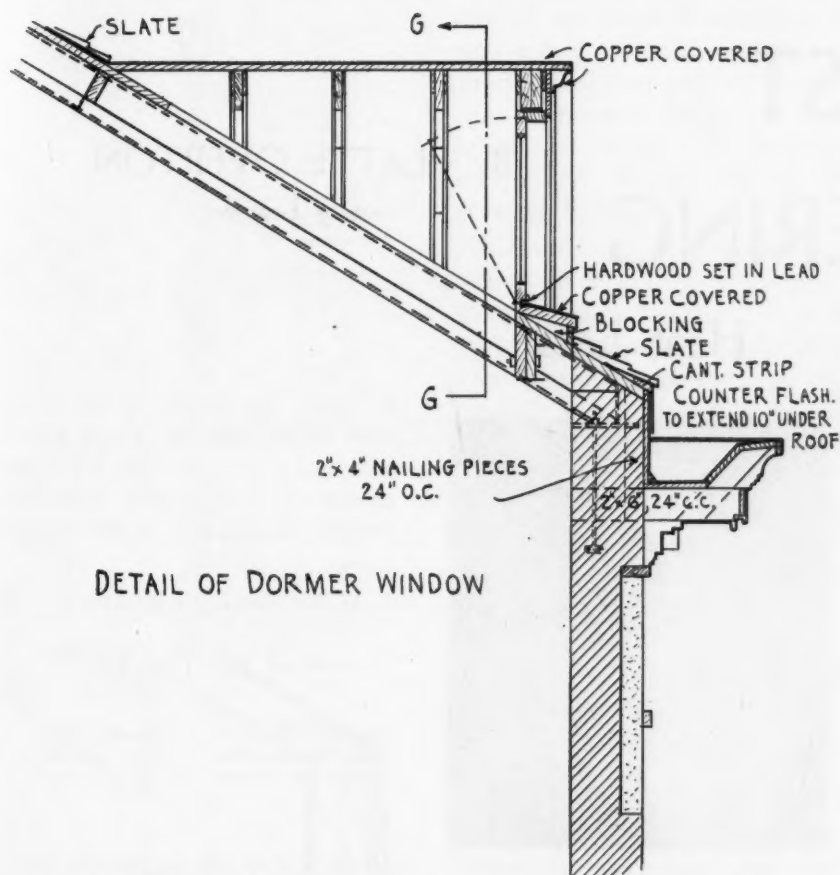
At the base of the urns the cupola assumes a spherical shape which is covered with copper on a built up wood sheathing and iron braced framework.

The ornament at the top of the cupola is a weather vane made of copper and punched with the initials of the building as shown on one of the photographs. This photograph also indicated that the weather vane was formed and put together in the shop and erected as a unit on the top of the dome.

In addition to the copper cupola



This is the weathervane. It is all copper, patterned and assembled in the shop and erected as a unit



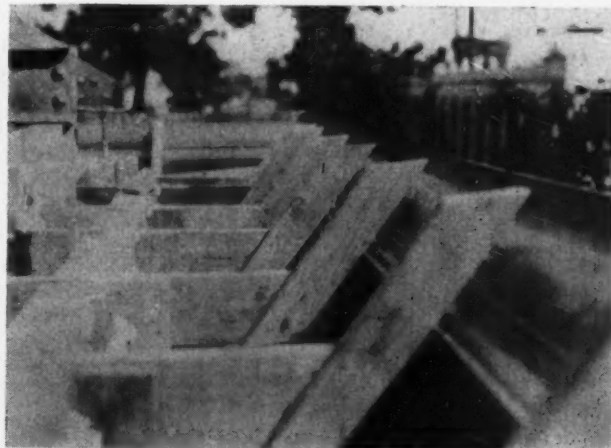
DETAIL OF DORMER WINDOW

This detail shows the construction of one of the wing dormers which are copper sheathed. The detail also shows the heavy copper gutter

there are some interesting copper dormers on the back wing of the building. A cross section of a typical dormer is shown. This indicates that the usual design of a circular top dormer was adopted. The roof of the dormer projects out from the slate roof on a level ending in a depressed semi-circular opening carrying the window. These dormers are set down almost at the eave line and only a short gap separates the copper of the dormer flashing from the copper flashing of the main wall gutter.

One of the details shows a cross section of one of the gutters. The gutter is copper lined and of the flat box type. It is supported at the top of the wall by 2 by 6's placed on 2-foot centers all along the wall.

Looking down the inside of the cornice. The sloping braces are gutter framing. This gives a good idea of the projection of the cornice



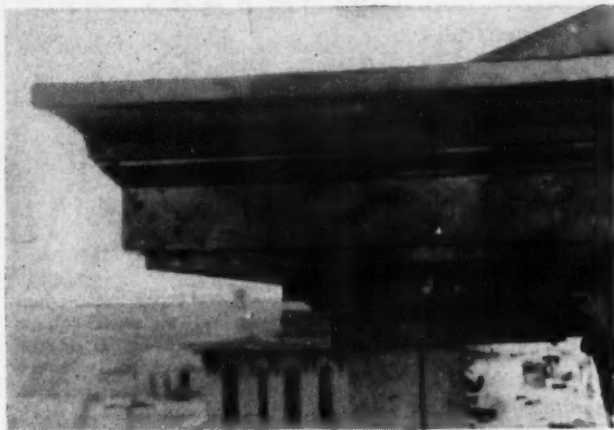
The exterior of the cornice. The heavy cornice with its row of dentil ornamentation is probably one of the heaviest copper cornices built this year

The copper of the gutter is carried back to wall elevation and flashed with the stone work of the stone course at the top of the wall.

It is worth noting that the cornice which tops the wall on all four sides of the main building is extraordinarily heavy for a modern building. In cross section this cornice is composed of a series of flat verticle and semi-circular surfaces ending at the bottom in a row of dentils for ornamentation. Due to the projection this cornice is supported by 2 by 6's horizontal and also 45 degrees. These 2 by 6's at 45 degrees form the inside support for the gutter which lies inside the cornice and outside the face of the wall. One of the photographs shows a closeup of this cornice from the inside and also the supports for the gutter.

There were many methods devised to construct the sections so that erection would be easy. One of the things contributing to this use of large sections of copper work is the size of the cupola. The cupola is just under 30 feet from the bottom of the weather vane to the cross section of one of the gutters. The gutter is slate roof at the lowest edge of the base section.

Throughout all the cupola wood bracing and wood sheathing were used as support for the copper. One



of the cross section drawings shows this backup in detail.

Practically all of the copper work with the exception of some parts which are lead coated copper were painted after erection to match the color of the stone trim.



# FAN BLAST ENGINEERING

By PLATTE OVERTON  
Heating Engineer

## Heat Loss

**A** B.t.u. is a measure of heat energy. B.t.u. is an abbreviation of British thermal unit, and is the heat energy required to raise 1 pound of water at 60 deg. to 61 deg. or 1 degree.

In calculating heat losses the B.t.u. is used and is generally expressed in B.t.u. per hr. per sq. ft. of exposed surface. The loss will vary with the difference in temperature between the outside and the inside of the exposed surface. Rain, snow, velocity of the wind, and the exposure direction will affect the loss, but we are interested only in a constant condition in this article.

**Specific Heat**—As mentioned, one B.t.u. is the required energy (heat) to raise one pound of water 1 degree. If we are required to raise other materials of one pound weight one degree, we would need more heat or less heat (B.t.u.'s) than with water.

It is one of the fundamental principles of heating that equal quantities of heat will raise equal weights of different materials a different number of degrees. This property of materials is referred to as the Specific Heat of the material. But in order to have some basis whereby the Specific Heat of all materials can be compared, the Specific Heat of any material is compared with the Specific Heat of water which is used as a standard and called 1.

Thus strictly speaking Specific Heat is the ratio of the amount of heat required to raise one pound of the material through 1 degree F. to the amount of heat required to raise one pound of water through one degree F.

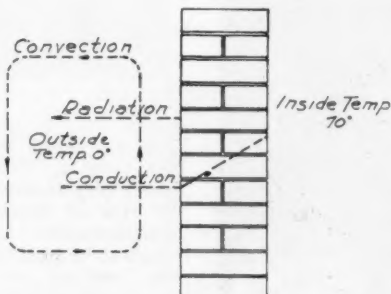


Platte Overton

As we are interested only in air, the specific heat of air is given as .2382 or 0.24. As we will use this constant many times we must keep it in mind. We have shown here the cross section of a brick wall 8 inches in thickness.

On the outside of this wall it is zero degrees (0 deg.) and on the inside 70 deg. above zero.

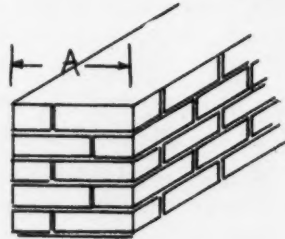
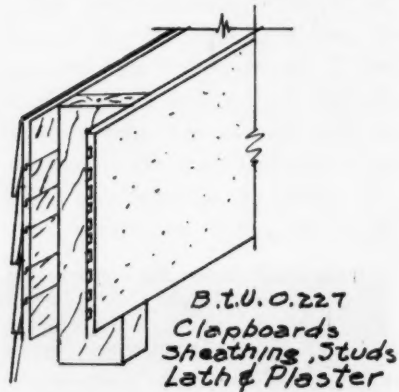
Heat from the inside of the wall is lost to the outside by three means: Conduction, Radiation, and Convection. As we are interested in the average B.t.u. loss for one square foot of this surface we will pass up these three items and call



This diagram shows the three ways heat is lost through an outside wall

it "loss." By laboratory test it has been found that the above 8-inch wall has a loss of 0.38 B.t.u. per square foot per degree difference between outside and inside temperatures.

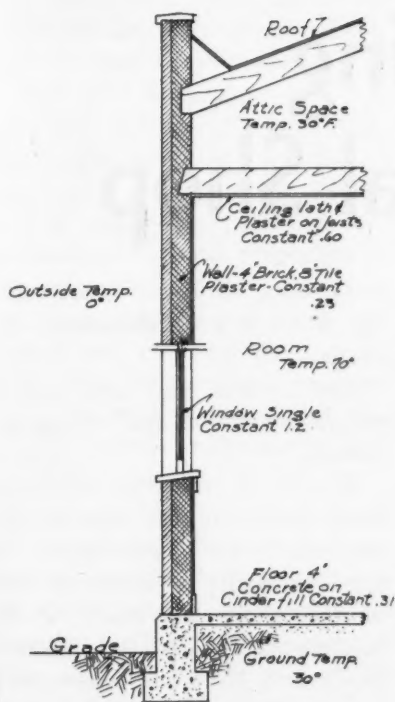
As our inside temperature is 70



A	B.t.u.	B.t.u.	B.t.u.
8"	0.38	0.36	0.28
12"	0.29	0.28	0.24
16"	0.25	0.24	0.21
20"	0.22	0.21	0.19
24"	0.19	0.18	0.16

No Plaster  
Plastered  
Turred Lath  
& Plastered

Laboratory tests have established the heat loss in B.t.u.'s per square foot of surface per hour per degree temperature for practically every type of wall construction. These losses are called constants in heating engineering



Heat losses in a house are through all the exterior surfaces indicated here. Each loss must be accounted for

deg. and our outside 0 deg. we have 70 deg. difference or  $70 \times 0.38 = 26.6$  B.t.u. per square foot. If we have 100 square feet then we have  $100 \times 26.6 = 2660$  B.t.u. loss for our wall.

If this wall is plastered, or furred and plastered, painted, or papered the constant will vary from 0.38 and the reader is advised to obtain charts that will show him all manner of building materials and their constants.

There are of course ceilings, floors, glass, and other surfaces as well as wall that make up heat loss, but they are calculated in the same manner or the constant times the temperature rise times the square foot of exposed surface.

The data sheet shown here is one

that the writer has chosen after experimenting with every known brand from the rule of thumb, "any room can be heated with a ten minute air change," to those records written on shirt cuffs, or old envelope backs.

Learn to use the data sheet and then file every copy as a permanent record. When the sheet is fully made out and complete with every detail of the requirements one may proceed with the design of the heating system with the utmost confidence.

Referring to the data sheet we note that items 1, 2, 3 are room dimensions, area and cubic space. Here shown is a sketch of a section through a typical building, floor, wall, window and ceiling. We will take these various items, 4, 5, 6, 7 and 8 and work them out from the sketch.

It will be noted that these items, 4, 5, 6 and 7 call for a constant and factor. As shown in a former paragraph the B.t.u. loss is the constant times the temperature rise times the square foot of exposed surface. On that data sheet we establish a factor which is the constant times the temperature rise.

After we have figured the various exposed areas in items 10, 11 and 12 we have only to refer to the factor and multiply our exposed surface by this factor for the B.t.u. loss for items 15 to 20 inclusive.

Item 4 is floor constant and factor. Our constant for 4-inch concrete slab on cinder fill is given as .31. Our temperature rise is ground temperature 30 deg. up to 70 deg. room temperature, or 40 deg. We now multiply our constant (.31) by this temperature rise (40)

Room No.	1	2
Use		
MEASUREMENTS		
1. Room Dimensions		
2. Cubic Feet Space		
3. Room Floor Area		
4. Floor Const. & Factor		
5. Ceiling Const. & Factor		
6. Window Const. & Factor		
7. Wall Const. & Factor		
8. Exposed Sash and Door Perimeter, equiv.		
9. Leakage B. T. U. per ft. of Perimeter		
10. Exposed Wall Gross Area		
11. Exposed Window Gross Area		
12. Exposed Wall Net Area		
13. Exposure Direction		
14. Room Temperature		
HEAT LOSSES		
15. Wall Loss B. T. U. per Hr.		
16. Window Loss B. T. U. per Hr.		
17. Subtotal Loss B. T. U. per Hr.		
18. Expos. Allow. B. T. U. per Hr.		
19. Floor Loss B. T. U. per Hr.		
20. Ceiling Loss B. T. U. per Hr.		
21. Leakage Loss B. T. U. per Hr.		
22. Total Heat Loss		
23. Deduct for Heater Slip		
24. Heater Building Loss Load		
SERVICE		
25. Air Supply C. F. M.		
26. Radiation C. F. M.		
27. Air Supply Inlet Temp.		
28. Air Supply B. T. U. Service		
29. Direct Rad. B. T. U. Service		
30. Direct Rad. sq. ft.		
31. Grav. Ind. Rad. sq. ft.		
32. Aspir. Cold Rad. sq. ft.		

This is the data sheet listing of items of measurement and heat loss which must be calculated in laying out a heating system. A complete data sheet will be shown later

and find it equals 12.4. This is our factor for future use.

Item 5 is ceiling constant and factor. Our table of losses gives us .60 as the constant for lath and plaster on ceiling joists. In attic spaces at zero degrees the temperature is assumed to be 30 degrees. 30 deg. to 70 deg. our room temperature gives us a rise of 40 deg. The constant (.60) times the temperature rise (40) equals 24 for our factor.

Item 6 is window constant and factor. Our window (single) has a constant of 1.2. Our temperature rise is 0 deg. to 70 deg., equals 70 times 1.2 equals 84 for our factor.

Item 7 is wall constant and factor. Our wall is 4-inch face brick with 8-inch tile and plastered, and our constant is 23. Our temperature rise is 0 deg. to 70 deg. equals 70 times 23 equals 16.1 for our factor.

The aim of this series on fan blast engineering will be to give readers those fundamental principles which must be understood if systems are to be laid out correctly. Each article will be short and cover in complete detail one phase of interest. If you do not understand any point raised, write at once. If we go too fast let us know. If you want something special explained, send in your request.

# Cost Accounting For the Sheet Metal Shop

**C**ONDUCTING a sheet metal shop for 29 years I have encountered problems of management that caused me much concern, and due to inexperience I have made some grave and costly errors. One of the most difficult problems was the correct distribution of costs over production, because it was the least understood. So I began to study this problem and as I learned and had a clearer understanding of its principles I adopted a cost system for our business.

I have no special training in cost accounting. I am not the originator of methods I will discuss here, nor do I claim that they are the best for the sheet metal industry; but—they have proved satisfactory to us.

In order to become a successful sheet metal contractor, it is of course necessary that you understand the mechanical end of the business; but equally important, if not more so, is a thorough knowledge of the executive duties involved in its management, such as **FINANCING, BUYING, SELLING, COLLECTING, ESTIMATING**, the managing of your help, etc. In these qualifications many fall short because they have had no training to fit them for such duties. In most cases, future sheet metal contractors are the mechanics of today, whose only training is mechanical, and who do not understand the business and executive qualifications required to conduct the business successfully. It is obvious that such men, when they become sheet metal contractors make poor competitors by bidding work below actual costs, because they do not know what their costs are, or how to apply them.

*\*Address before the Wisconsin Sheet Metal Contractors Association.*

**By C. F. WARNING\***

I wish to emphasize that it is necessary in a sheet metal business to have a good bookkeeping system that will give you complete details of all the financial operations of your business. You must also keep a record of all jobs that you have completed, describing the kind of work, the amount of material and labor used, and their costs. Original job sheets or shop orders filed under various classifications, alphabetically or any other way so they are easily accessible, are ideal for this purpose and involve no extra work except the time for filing.

I will show several ways for distributing indirect expense for comparison, and select the method I believe the most fair and practical in the sheet metal industry. Let us first consider—

"What are the operations in a sheet metal shop?" The renting or buying of a building suitable for a shop; purchasing machinery, tools and equipment for the manufacture of sheet metal cornices, skylights, gutters, ducts, ventilators, tanks, and the making of a thousand-and-one special articles of sheet metal. This requires the purchasing of sheets, called raw material, and various other items, and employing labor to turn these raw materials into finished products. This is clearly a manufacturing operation.

The purchasing of various kinds of roofing materials, furnaces, metal ceilings, fans, motors, and various articles not made in the shop, and employing labor to apply or install is an erection or contracting operation, requiring no shop labor.

Then there is the buying and selling of many items on which there

is no labor expended except selling, which is a merchandising operation.

And last and most important, is the administration and selling operation.

If it were practical to divide these operations into separate departments, the distribution of overhead would be simplified; but in most shops this would be too cumbersome unless the business was a very large one, whose sales amount to hundreds of thousands of dollars. Most of our members however, have shops employing from two to about fifteen or twenty men, and it is to these that I recommend the methods presented here.

The bookkeeping system should record all operations divided into two classes; viz.: "Manufacturing" and "Administration and Selling." The indirect expenses should be arranged under these two heads. We will call the one "Indirect Manufacturing Expense," consisting of Superintendents, Central Labor, Insurance, Taxes, Light, Heat and Power, Depreciation, Repairs, Trucking and any other expense in manufacturing that cannot be charged directly to the jobs. The other we will call "Administration and Selling Expense," which consists of Office and Clerical Salaries, Stationery, Supplies, Postage, Dues and Subscriptions, Telephone, Telegraph, Legal Fees, Traveling, Advertising, Commissions, and any other expenses incurred in Administration and Selling.

Now for a method of distributing indirect manufacturing expense over production, and administration and selling expense over sales.

In my opinion the indirect manufacturing costs should be pro-rated over the productive labor hours, for



the reason that nearly all of the manufacturing expenses are necessary to keep labor employed, and labor is paid by the hour. The cost per hour will vary in the same shop: the skilled mechanic may receive four times as much as the apprentice or helper, but each will consume about an equal proportion of the indirect manufacturing expense per hour. The apprentice or unskilled man, requiring more supervision and more time, consumes really more than the skilled mechanic, but we will charge each with the same rate. To do this it will be necessary to keep a record of all the productive hours, which can be done in a time book, where the daily hours of each man are recorded together with the rate per hour, and the amount paid at the end of each period or pay day.

The non-productive hours of each man can also be kept in another column, on the same page, the totals of both productive and non-productive hours carried forward until the end of the period, thus requiring very little extra bookkeeping. I advise that all records of work done both in and outside of the shop, that are filed for reference, (to be used for estimating future work) show the labor hours expended.

When estimating any job, no matter how large or how small, always specify the labor hours your experience tells you should be used to do that particular work.

I think most of us agree that labor is the most uncertain element to figure in the cost of any piece of work. Make it more certain by

keeping records of the hours instead of labor costs. With a good set of hourly records filed so that they are easily accessible, you will be surprised how accurately the cost of a job can be estimated, when compared with the actual cost of doing the job. The cost per hour may vary from time to time; in fact the labor hour of a mechanic costs about four times what it did when I first began sheet metal contracting, but it takes as long to do a piece of work in the same way today as it did then, or as it will ten years from now.

Let your records show the hours per square for applying a tin roof, for erecting a steel ceiling, a slate or tile roof; pounds per hour for various kinds of duct work, hours for installing a heating plant, hours per 100-feet of gutter, conductor, flashing, etc. Such records will also aid in classifying workmen—those who can do work most efficiently in the shortest time should be paid accordingly, and those who will not or can not do the work in the average time, be told to do so or be dismissed.

For distributing administration and selling cost over production I recommend pro-rating it over the total manufacturing costs, which is material, labor and overhead included. To show how these methods can be applied, I will use the figures of Table 1 and Table 2; they are not actual figures, but arbitrary, used here to illustrate the subject.

Estimate No. 1 has about the same proportion of material and labor costs as the total for the period; if all jobs were of similar

TABLE 1

<b>TOTAL COST OF BUSINESS DONE FOR THE PERIOD.....</b>	<b>\$39,600.00</b>
Materials .....	\$21,000.00
Cost of 16,800 productive labor hours.....	10,800.00
Indirect manufacturing expense.....	4,200.00
<b>Total manufacturing cost.....</b>	<b>\$36,000.00</b>
Administration and selling expenses.....	3,600.00
<b>Total cost for the period.....</b>	<b>\$39,600.00</b>
\$4,200.00 indirect manufacturing expense divided by 16,800 productive labor hours equals hourly rate O. H. 25c.	
\$3,600.00 administration and selling expense equals 10 per cent of \$36,000.00 manufacturing cost.	
Administration and selling expense rate equals plus 10 per cent manufacturing cost.	

TABLE 2

## ESTIMATE No. 1

Materials .....	\$106.40
42 hours labor, 90c.....	37.80
42 hours labor, 40c.....	16.80
84 hours O. H., 25c.....	21.00

\$182.00

Administration and selling, 10% 18.20

Cost of job.....\$200.20

## ESTIMATE No. 2

Materials .....	\$174.00
4 hours labor, \$1.00.....	4.00
4 hours labor, 50c.....	2.00
8 hours O. H., 25c.....	2.00

\$182.00

Administration and selling, 10% 18.20

\$200.20

## ESTIMATE No. 3

Materials .....	\$ 28.40
128 hours labor, 95c.....	121.60
128 hours O. H., 25c.....	32.00

\$182.00

Administration and selling, 10% 18.20

\$200.20

## ESTIMATE No. 4

Materials .....	\$182.00
No labor .....	
Administration and selling, 10% .....	18.20

\$200.20

proportions the distribution of overhead would be simple, and most any method would give equally satisfactory results. But this does not occur in the average sheet metal shop, but is likely to fluctuate from one extreme to the other as shown in estimate numbers 2, 3 and 4.

In estimate No. 2, cost of materials is extremely high in proportion to the labor. In estimate No. 3 labor is the largest cost item and materials very low. Estimate No. 4 is all material and no labor except selling. These four estimates represent actual conditions that may occur in the average sheet metal shop. The total cost of all four estimates are identical; the administration and selling costs of all four are the same, for it will require about the same effort and expense to sell estimate No. 4 as it will to sell estimates Nos. 1, 2 and 3; therefore, all are charged with the same proportion of administration and selling expense, pro-rated on the basis of 10 per cent added to

TABLE 3

\$7,800.00 indirect expense equals 72.2+ per cent of \$10,800.00 direct labor cost.  
 \$7,800.00 indirect expense equals 24.5+ per cent of \$31,800.00 direct labor and materials cost.

## LABOR COST METHOD

Estimate No. 1—72.2 per cent of 54.60 labor cost equals 39.42 overhead.  
 Estimate No. 2—72.2 per cent of 6.00 labor cost equals 4.33 overhead.  
 Estimate No. 3—72.2 per cent of 153.60 labor cost equals 110.90 overhead.  
 Estimate No. 4—72.2 per cent of none equals none.

## LABOR AND MATERIAL COST METHOD

## Estimate

No. 1—24.2 per cent of 161.00 labor and materials cost equals 39.45 overhead.  
 No. 2—24.2 per cent of 180.00 labor and materials cost equals 44.10 overhead.  
 No. 3—24.2 per cent of 150.00 labor and materials cost equals 36.75 overhead.  
 No. 4—24.2 per cent of 182.00 labor and materials cost equals 44.59 overhead.

the manufacturing costs. The manufacturing overhead in the four estimates, varies according to the hours of labor. Using the same total cost figures we will pro-rate the overhead by the productive labor cost method and the labor and material cost method, which seem to be the two generally recommended for the sheet metal industry (Table 3).

In Table 4 the amount of overhead charged to each of the four estimates by the three methods employed is shown for comparison.

Estimate No. 1 having about the same proportions of the labor and materials as the total for the period, the overhead charges pro-rated by the three methods show but a slight variation. Estimate No. 2 shows the overhead charge by the labor cost method is about one-fifth of the amount as charged by the hourly plus percentage method, and by the labor and material cost method more than double that amount. In estimate No. 3 the labor cost method charges more than double the amount of the "hourly plus percentage" method and the "labor and material cost" method about 73 per cent of that amount. Estimate No. 4 has no labor so there is no overhead charge by the "labor cost method"—but by the "labor and material cost" method the amount is about two and one-half times that charged by the "hourly plus percentage" method.

Assuming that competitive bidders all had the same labor and

material costs on a particular job, where materials cost is high and labor cost low, the one using the "labor cost" method for distributing overhead would be the low bidder and the one using the "labor and material cost" method would be high. A job where labor cost is

**For the last several months we have been stressing bookkeeping. Here is an actual contractor's experience over a period of years. The facts presented are well worth studying carefully**

high and materials low the situation would be reversed and where materials only with no labor is bid, the one using the "labor cost method" would be low, as no labor means no overhead charge.

Our analysis proves, then, that of the three methods used here for distributing overhead, the HOURLY PLUS PERCENTAGE method is the most ACCURATE for the sheet metal shop.

Those of you who have no cost

system in operation and have never given this subject much serious thought may imagine this system is cumbersome and costly to operate. That is because it is not understood; but—those who have a cost system understand how simple they operate when once under way. I suggest that, for the purpose of study and analysis, you refer to your last statement of overhead accounts; classify them into manufacturing and sales, then determine the percentage they bear to the total labor and material cost. If you do not have a record of the total labor hours find the percentage of sales cost as shown in the foregoing examples, apply these as outlined, on your next jobs, and compare the overhead in each classification and determine for yourselves if the distribution is fair, for you must have confidence in the method you are using—that the dollars you are spending for overhead are distributed over production where they belong. Once you have this confidence you will have a feeling of security when submitting a bid that it is right, for it has been carefully and scientifically prepared.

To those of you who have no cost system I will say GET BUSY AT ONCE, study this subject and adopt a system as soon as you can; this will mean hard work but it is well worth your time and effort for it will pay you back in dollars. Every sheet metal contractor should know enough about his bookkeeping system to analyze intelligently the statements that his books show, even if he has a bookkeeper to do the work. This is one of the necessary qualifications in good management of your business, for good bookkeeping and cost accounting are most necessary in today's highly competitive market.

TABLE 4

	Estimate			
	No. 1	No. 2	No. 3	No. 4
Hourly plus per cent rate method.....	39.20	20.20	50.20	18.20
Labor cost method.....	39.42	4.33	110.90	none
Labor and materials cost method.....	39.45	44.10	36.75	44.59

# Round to Rectangular Hood

For Raymond Sheard, Hamilton, Ohio

By W. R. HAINES

Contributing Editor

THE special problem requested by Mr. Raymond Sheard of Hamilton, Ohio, is a very practical fitting used quite generally by the trade. It is a type of fitting, which when made first-class mechanically, is a neat looking piece of work.

Mr. Sheard wished a range hood pattern of the following sizes: 30 x 36 in. rectangle to 50-in. diameter round, with a straight height of 14 inches. The rectangular opening, 30 x 36 in., has an area of 1080 sq. in., and the 50-in. diameter round opening has an area of 1963.5 sq. in. This is quite a difference in areas, but I am taking it for granted that "the customer is

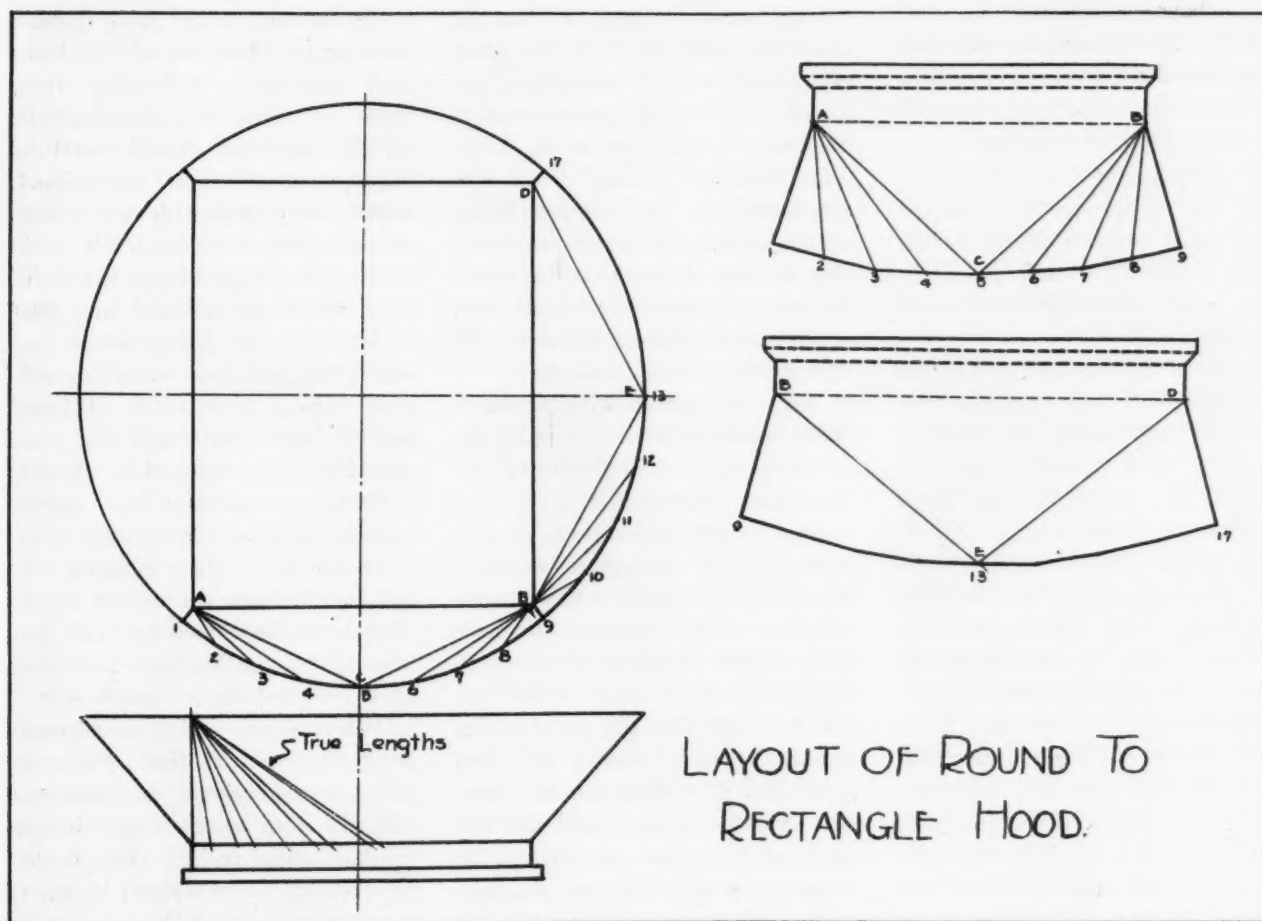
These patterns are worked out in response to requests from readers. The aim is to make each pattern as simple as possible. Your problems are invited

always right," and that this is what he wants.

The first step in development is to draw your plan. I am putting the radius point directly in the center, according to subscriber's sketch. Then step off your circle into equal parts, as 1, 2, 3, etc.

The problem is to find the true lengths of your elevation on the hypotenuse of the triangle. This is done by simply setting your dividers at points A-1, A-2, etc., on plan, and setting them out on your base line, then opening the dividers up to your straight height, which in this case is 14 inches.

Seams are shown on the four corners, as it saves material and eliminates any seams in the center of your fitting. In making up the fitting, you will require four pieces of material, two as of A-B-1-9 and two as of 3-D-9-17. Any type of seam may be used, but would suggest that in this particular case a rivet seam would be best.





# LET'S MAKE SOME MONEY

by  
BENJAMIN F. JOHN



## "Selling the Job"

"**W**HAT's this thing about selling, this fellow writes about in this magazine?" said a heating contractor one Monday morning not long ago. "I guess *he* never sold a roofing or heating job," and on and on.

But what about selling in our trade? Is not the way and how to do it very simple?

Prepare first, then GO sell it.

Out of 30 odd who complained about losing a certain job, 22 did not go or make a further effort, and lost a chance to sell the job. Isn't that GO most important, and when we do GO don't things turn out differently from what we expected? It's not so difficult then, is it?

A salesmanship course is a fine thing and everybody who sells can gain many pointers about selling from it, but it cannot guarantee that you will sell the job, unless you do your part.

Why, if we received orders for one-quarter of our estimate sent, we could not handle the business on time. The overflow in busy times is the only thing that keeps some shops on the map.

But when a prospect wants something, and asks for an estimate, that man wants to buy, and in some way or other feels we can supply his want. He opens the door to us to tell him what he needs, and if we know how to do the job mechanically and well, and can show him similar jobs that we have done well or refer him to one of our customers, and have that customer say it was all right and maybe flatter

us a bit, the job, in a large majority of instances, is sold.

Doesn't everybody admit that "the wagging tongue of a satisfied customer is our best salesman?" We should use it.

Like nature, too much rain at one time spoils things. Orders likewise come together too much, and then comes the gap. Business discovered this up and down thing was not at all desirable and started to fill the "gap." There is where salesmanship comes in as a balance wheel.

Our industry found this out by watching others. For the past eight years we have proved that our business is not altogether seasonable as we long believed it to be. That word "psychology" which was introduced into our industry really meant, as far as we were concerned, that we had to prove to the public that we had something to sell them in Winter as well as Summer, and even during a holiday season.

When we are seeking business from those who have *not* asked for an estimate, and we wish to sell something that we KNOW our prospect ought to possess to protect him and his belongings, beautify his property, save money, raise comfort or convenience, then we must prepare further, seek an opening, demonstrate that which we wish to sell him and get him interested, give references, etc., then "SHUT UP" and let him talk himself into the order. And the best part of it is that he will if the money is available or we can make terms satisfactory.

We seek prospects through advertising or other means, or we learn that one of our customers has talked to his friend or neighbor about us, and the thing we sold him, and he tells us that this friend or neighbor is interested, and in the next breath says "GO SEE HIM, and mention my name.

Of course the friendly customer may be a little too enthusiastic in our behalf, so when we have a lead we should realize that we must interest that prospect in some manner.

The person we are going to meet in nine instances out of ten looks and acts quite differently from what we previously imagined he would, and we should carefully think about this point beforehand, and act and speak with care at first. Some salesmen do not think at all, and try the "high and mighty stuff" that says, "I know and I know that I Know," and strange as it may seem, they get away with this attitude ONCE in a while. I know an oil burner salesman like that, who has been employed by a dozen different companies for several months each, and made some good sales, yet he is still wondering why his valuable services are not appreciated. He is termed the "ruff diamond," but the diamond is looking glass. It reflects too much self.

When we are selling a cold prospect, that is the time when we either consciously or unconsciously use the four steps taught in the book of salesmanship. These books, by the way, were written by salesmen who analyzed the manner in

which they themselves gold goods successfully, and cashed in on it by selling their books to you and me.

These four steps are:

1. Attract attention.
2. Arouse interest.
3. Create desire.
4. Induce action.

But to say it simply, these mean that when we receive a telephone call, a return card, or are sent with an introduction from a friend, we want to be able to tell our story so that the prospect will know that we know what we are talking about, and know our business, which we can prove by jobs we have done.

So I have found in practice that a fifth step and rule is needed "BE YOUR SELF," and learn to *give the prospect a chance to talk*.

If we start to parrot out of a book or use technical terms, until we are sure of our ground, and know we are understood, the other fellow thinks we have just started to sell, or are using "high brow" stuff on him. His spine stiffens and in most cases we are out. I know I tried both ways, and found it pays to be your self. You know it, too, when such a salesman comes into your place of business.

The best plan is to talk to the prospect as though he knew exactly what he wanted, and make him ask questions, then if you know your business, you will be sure just how to talk to him and you are sure of your ground. If he does know, according to the best practice, then we can agree with him, and that's something to him, and then perhaps we can add something he might not know and he will take it in the manner in which you meant it. But always, at some point, be sure to impress him that we are especially fitted by experience and equipped to give him the best *for* his money, as we have learned to do by study and long practice. If this proof is something we can carry, lay it before him and make it work if possible, or describe it in detail and the results obtained from it, especially if it will save him money. That is what is termed

arousing interest. Desire will follow if the money is available or terms can be made to suit him.

Do not repeat a thing over and over again, unless you are asked, and even then change the language of your description. Don't talk too long or too much.

Appearance is important, yet I have seen mechanics clad in overalls sell good sized jobs at higher prices than the boss would have asked to a neighbor across the street from where he was working, by explaining very carefully and politely to the lady just what she should have done and why, and how he had done the same thing on the job he was working. Naturally his position carries no responsibility, and as the owner asked him as a mechanic, she placed herself in his hands.

We all know that we should appear at a home or office with the proper appearance, but to dress as though we were "putting on the dog" just won't get us anywhere.

Most of us look at the man's ability and record rather than appearance, and any customer worth while having knows we cannot look like a bridegroom every day. But a clean shave, a dark suit, hat and overcoat is all that is needed.

When we estimate we usually see the job. Then when the estimate is made up and we mail it we have the best possible chance to gain attention of the customer, especially if we have competition. An estimate letter written plainly and in sections, describing what we intend to do and why, the kind of material and something about special work or workmanship needed to be done by a mechanic who has had experience, etc., and many other things that come to mind while making up an estimate in many instances has opened the way for an interview and offers a good chance to sell the job right then and there, if we have our contract made out and ready for the signature.

This contract may be made on the bottom of the letter, in duplicate, and all that is needed is an

additional phrase, something like the following:

Blank & Company,  
Anywhere.

Gentlemen: Proceed with the above contract, as specified above, for the sum of ..... dollars (\$.....).

Signed.....

Contractor .....

OH! How often men have wished for that contract blank, when the sale seemed certain, and before the prospect could change his mind?

Never talk price until the last moment. Then place the contract in the open and have a pen handy. The important point is to build to the price rather than have the price as an obstacle. A blunt statement of price at first occupies the mind of the prospect during the sale. If we lose on price, we would lose anyway, if the prospect could not or will not pay it. You can build a price and show how to pay.

While reading this some are thinking, well that might do for a shop that has the time and can prepare all that stuff, but the average shop is not handled that way in practice. I can tell all this when I see the customer and usually the job does not need samples, photos, literature, etc., and I cannot write a long letter. I haven't the time, and anyway most of my work is jobbing. It's price that counts, first, last and always.

DON'T YOU BELIEVE IT BROTHER. I thought so too once. 1930 was a rotten year because we did not learn soon enough how to SELL. This has been proven by the shops I know about, whose books for years prior to 1930 showed just a living and a poor one at that, and in 1930 shows a 50-50 basis and some profit, simply because these shops used the manufacturer's literature, copied letters from the trade magazines and even advertisements, bought samples of draft regulators, registers, thermostats and humidifiers, etc., and used them to SELL, and added that EXTRA effort that

(Continued on page 47)

# FAN FUNDAMENTALS [Part X]

## With Particular Reference to the Use of Fans in Heating

**D**URING the several months that these articles on Fan Fundamentals have been appearing in the *AMERICAN ARTISAN*, the writer has received many inquiries regarding various phases of fan heating. Although each specific inquiry was answered at the time it was received, it is believed that there are other readers who have had the same questions in mind but have not written in about them.

In this, the final article of the first series, some of the more frequently asked questions will be briefly discussed.

**Q.** "Why can't I put an ordinary desk fan in the cold air duct and get just as good results as I would with a regular furnace fan which is more expensive?"

**A.** Such a fan could be used in some cases and the results at first might be satisfactory. But there are a number of reasons why it is not advisable. "Good will" is one of the most valuable assets that any heating contractor can own; it costs money, time and effort to build up the kind of reputation in a community that results in profitable good will, and the use of questionable material on any job can easily destroy it.

One of several important reasons why an ordinary house fan ought not to be mis-used as a furnace fan is that the motor does not stand up under such service. Electrical equipment manufacturers build desk fans of both the oscillating and non-oscillating types in sufficiently large quantities that it is well worth their while to design and build *special* motors for such fans. Every one of these motors for each size of fan is developed to *exactly* fit

**By G. A. VOORHEES**

*Heating and Ventilating Engineer,  
Indianapolis, Ind.*

the particular fan blades with which it is used *when the fan is running under its normal conditions.*

When such a fan is running in the open air within a room, it may give years of satisfactory service, but put that same fan in a cold air duct where air flow is restricted ever so little, and motor trouble develops sooner or later—usually quite soon. It is much better to pay

office; how about it? The furnace is plenty big enough to heat both the shop and office.

**A.** The manufacturer of this booster fan says that the motor will probably overheat if placed in a warm air duct. Most motors will stand a temperature rise of 40 degrees Centigrade which is equivalent to 72 degrees Fahrenheit and if the average air temperature at the ceiling of the office is around 85 degrees, the air temperature in the heat pipe would be too high for a motor built to withstand a tem-

Here is problem  
where adding the  
long office run  
threw the system  
out of balance

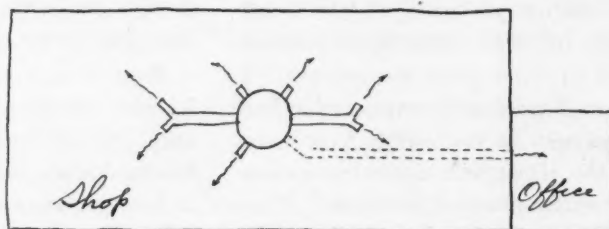


FIG 1

a few dollars more and get a unit that is *built* for furnace fan duty.

**Q.** I installed a furnace as shown by the inclosed diagram (See Figure 1) and it gave good service in heating a shop; later an office was added and I ran a pipe as indicated by the dotted line. By partly closing the dampers in the short pipes to the shop, heat was forced to the office but there was complaint from the shop that they didn't get enough heat and in the office the temperature of air up close to the ceiling was above 85 degrees and at the floor below 60 when the breathing line temperature was 70. The owner will not consider making the job a complete fan system. I have a twelve-inch booster fan on hand and would like to use it in the warm air duct to the

perature rise of only 72 degrees Fahr.

If you will arrange so that an ample supply of room air will mix with the heated air carried by the warm air leader before it reaches the fan, I think you will have no trouble. I have several times used an arrangement similar to that shown in the attached drawing (Figure 2) and the results are excellent. This is especially good where there has been too great a difference between floor and ceiling temperatures. By drawing air from the floor line and mixing it with the incoming warm air, the ceiling temperature is reduced and the floor line temperature raised.

**Q.** What books should I read to get a thorough understanding of fan heating?



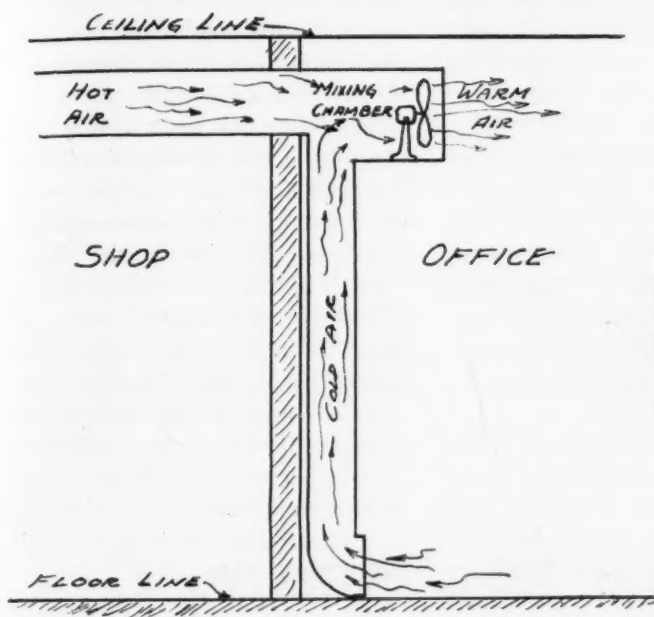


FIG. 2

And this is a suggestion for equalizing room temperatures and at the same time drawing only the right allotment of air from the furnace

the warm air heating field.)

A. Unless you have some definite idea of a distinct improvement over the present furnace fans; an idea pronounced perfectly sound and practical by *disinterested* furnace men who have had ample experience in fan heating, it is doubtful if you will find it profitable to enter the field.

For those who are experienced in *neither* warm air heating nor in fan manufacture, there are countless pitfalls. To those who are actively engaged in building fans of either the propeller or centrifugal type for ventilation work, it may look like an easy matter to enter the furnace fan field, but such manufacturers should keep in mind that production is really the small end of it—*merchandizing* furnace fans is something entirely outside their experience. The present conditions in the furnace business are radically different than those existing in the fan market with which they are familiar.

In the warm air heating business today so far as it concerns the better type of installations, engineering is as vitally important a merchandising factor as selling. And furnace fans are used in only the better installations.

Furnace fan manufacturers (and furnace manufacturers also) are going to find that more than ever before, if they retain and develop their better dealer accounts, that they must maintain a closer contact between those dealers and their own engineering department.

Q. How close to a cold air face can a fan be placed without danger of complaints about noise?

A. As pointed out in various articles of the series, this will depend considerably on the kind of fan that is used. Generally speaking, however, much can be done toward insuring quiet operation, by placing the fan as far as possible from those points where sound would be particularly annoying.

The intensity (loudness) of sound in the open air varies inversely as the square of distance from the

Q. What are the best technical books covering fan design?

Q. For a furnace contractor who is going into fan heating work, what reference books should he have?

A. More inquiries have been received relative to books on fan heating and warm air heating in general, than on any other phase of fan work.

The Warm Air Furnace Fan Company of Cleveland, used to issue some very practical bulletins written by Mr. J. C. Miles, which can probably be obtained by writing them.

For those who want to go into the more technical matters the catalog of Furblo fans issued by the Lakeside Company of Hermansville, Michigan, is good.

For the practical warm air furnace man who will take the time and make the effort to study the clear explanations given, various sets of Platte Overton's plans which can be obtained from the AMERICAN ARTISAN, give perhaps the most complete explanations of the application of fan engineering principles.

Harding and Willard's "Mechanical Equipment of Buildings," Volume I, published by John Wiley & Sons, New York City (price

\$10.00) is the most complete modern textbook covering the entire field of heating and ventilation. It contains much information of real value for the man who will study it.

The new ninth edition (1931) of the "Heating and Ventilating Engineers Guide" (price \$5.00) may be ordered from the American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York City. It is perhaps the most up-to-date book as a new and revised edition is issued each year.

An elementary book that should be of value, is A. M. Daniels' "Warm Air Heating," a new edition of which has recently been issued. It may be obtained through the AMERICAN ARTISAN.

"Fan Engineering," published by the Buffalo Forge Co., Buffalo, N. Y. (price \$4.00) is too technical to be of practical value to the majority in the warm air heating business. The heating contractor who goes after the larger fan jobs, and the manufacturer who may contemplate designing a furnace fan, will find it of considerable interest.

Q. We are thinking of manufacturing a furnace fan and would like to receive any suggestions that you care to offer. (This, variously worded, has come from a number of manufacturers entirely outside

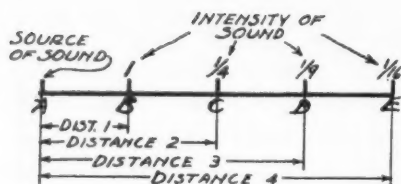


FIG. 3

Intensity of sound varies inversely as the square of the distance. Varying the distance of fan from furnace has much to do with noise

source of the sound. Thus, if the point "A" (Figure 3) represents the source of a sound and the points "B," "C," and "D" are points at which the sound is heard, the distance AC being twice that of AB, AD being three times and AE four times AB, then the relative intensities of the sound are as follows:

At the point "C," the distance AC is  $2 \times AB$ . The reciprocal of 2 is  $1/2$  and the square of  $1/2$  is  $1/4$ ; therefore the sound at "C" is only  $1/4$  as loud as at "B."

At "D" the distance from the source is  $3 \times AB$  and the intensity of the sound will be the square of  $1/3$  which is  $1/9$  of its intensity at "B."

Likewise at "E" the sound will be only  $(1/4)^2$  or  $1/16$  as loud as at "B."

Here is an example of the practical application of this principle. In a church, a basement class room had a cold air face opening into an underground duct. All other return air ducts were relatively short and, to overcome the greater fric-

tional resistance of this one long duct, a small booster fan was placed in the "first position" shown in Figure 4. There was considerable complaint of noise and the heating contractor bought another fan, this time a somewhat more expensive low speed fan. The trouble was overcome but it was demonstrated later that the original high speed fan placed in the "second position" was just as satisfactory as the more costly low speed unit placed in the original location.

Sometimes short return air ducts (Figure 5) where the pipe drops straight down from a cold air face to the boot, make trouble if a fan is placed as shown in the figure. It

where there need be no provision for gravity circulation, the fan running whenever heat is available at the furnace for delivery to the rooms, the plant may well be designed as a straight mechanical system and the pipes may be made quite small with correspondingly high air velocities in the ducts. Here is a rule that works well:

1. Figure the sizes of warm air leaders that would be required for gravity circulation, using the Standard Code rules for first floor rooms. (Use the first floor rules regardless of whether the room in question is located on the first or second floor.) Call this area so obtained the "code area" of the room.

This is how a job was installed and how noise might have been reduced using the same fan

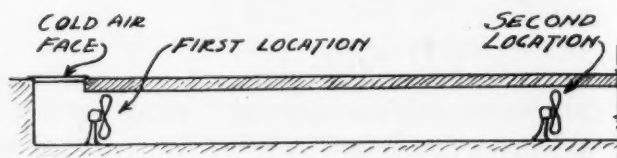


FIG. 4

is usually better to lengthen the duct and place the cold air face further away. The same is sometimes true when there are warm air pipes with registers quite close to the furnace; the fan noise (unless a quiet fan is used) which is quite noticeable may be lessened by moving the register to a more distant point in the room.

Q. What is a simple and practical rule for sizes of warm air pipes in the case of a trunk line system? Mine are mostly oil burner jobs.

A. In oil and gas fired furnaces

2. Use warm air registers, the free areas of which are the "code areas" for the rooms. (In other words the registers are the same size as would be used for gravity circulation.)

3. Make the cross sectional areas of wall stacks and branches from the main trunk line, one half of the "code area" of the room or rooms supplied.

4. Make the cross sectional area of the main trunk line equal to  $1/3$  (or more) of the combined code areas of the rooms supplied.

With a register air temperature of 130 degrees, this method of proportioning the ducts will give velocities as follows:

Through warm air registers, 250 F.P.M.

Through wall stacks and branches from the main trunk line, 500 F.P.M.

Through the main trunk line not more than 750 F.P.M.

This question which really comes under the head of applications of fan heating principles will be fully discussed in one of the forthcoming

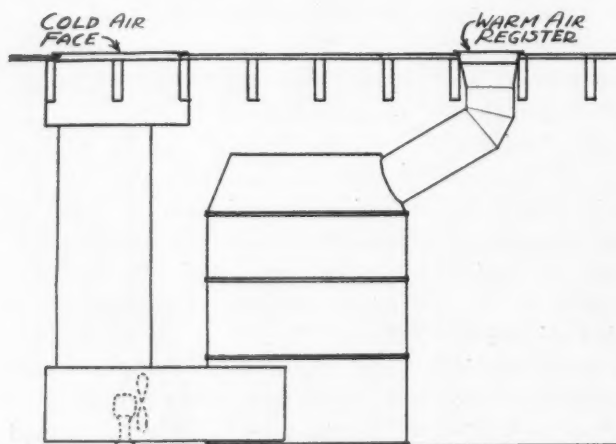


FIG. 5

This set-up often causes noise. The trouble can be remedied by moving the return air face or lengthening the drop duct

articles. The brief rule given above is based on sound engineering principles and the velocities are within the limits suggested by the American Society of Heating and Ventilating Engineers for fan systems in residences and other small buildings.

Q. If part of the cold air supply for a fan system is drawn from out of doors and part is recirculated, which is required in our state for heating public garages, isn't there

some simple rule for determining the temperature of air entering the furnace?

A. There is an approximate rule as follows:

1. Multiply the temperature of the recirculated air by the per cent of air recirculated.

2. Multiply the per cent of fresh air by the outside temperature.

3. Add these two products to obtain the temperature of the mixture.

For example: If 70 per cent of the air entering the furnace is drawn from inside the building and 30 per cent from outside, with the temperature of the recirculated air 60 degrees and of the outside air 10 degrees below zero, the temperature of the mixture as it enters the furnace is approximately:

$$[0.70 \times 60] + [0.30 \times (-10)] = 39 \text{ deg.}$$

This rule is sufficiently accurate for practical use.

## Servicing Cost an Important Factor in Determining Oil Burner Profits

[illegible]

**C**OST of servicing often cuts materially into the annual gross profits on oil burners. While care in making the installation and

final adjustment of the burner eliminates much of the need for service later, C. W. Pansch, Racine, Wis., sheet metal and warm air heating

contractor, has worked out the form so that he will have a complete record of the service cost on every burner installed by him.



# Moisture Condensation Can Be Eliminated by Ventilation

**H**ERE is an interesting problem in moisture condensation which is solved by ventilation. The problem entails quite a number of factors which must be taken into consideration.

The contractor writes that this building has a pitched roof, pierced with light wells as shown on the sketch. The roof is galvanized iron supported on ship lap yellow siding.

There are two ceilings inside the building as indicated by the dotted lines.

The trouble is that moisture gathers on the under side of the galvanized iron until so much accumulates that it falls onto the ceiling and seeps through.

Quite a number of methods have been tried, but no method has so far worked. It seemed to us that this was a problem for some good ventilation man so we asked Paul R. Jordan to look over the sketch.

If any of you ventilator men don't agree with Mr. Jordan's conclusions don't hesitate to send us your views.

Here is what Mr. Jordan says—

The condensation problem presented by A. H. Cramer of Cramer Bros., Tiffin, Ohio, presents practically the same question as every condensation problem. In order to know what to do we must first determine certain conditions and causes. In other words, we must diagnose the case before we can prescribe for it.

In condensation we have two conditions, first, moisture in the air; second, a cold surface. The moisture in the air will naturally vary in its absolute quantity according to temperature. However, the thing that we are interested in is

**By PAUL R. JORDAN\***

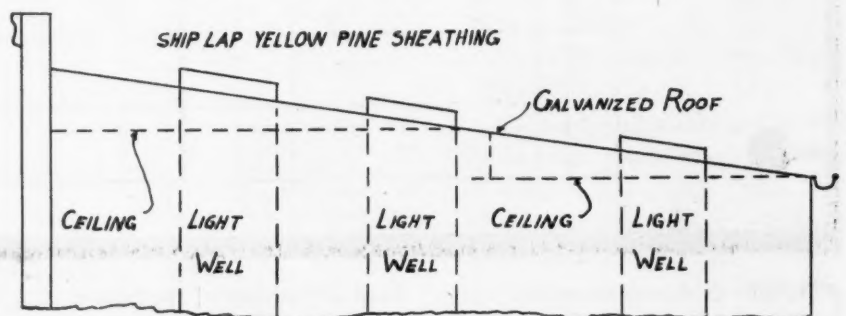
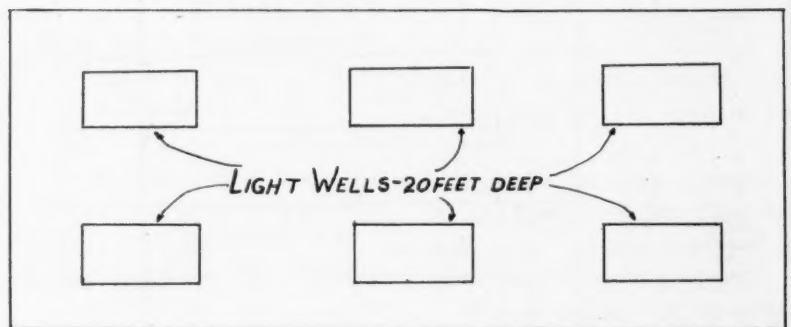
not the total amount of moisture in the air, but the relative amount as compared with the greatest amount it could absorb. The coldness of the cold surface also is a relative matter; that is, the thing that counts is how much colder it is than the air within the room.

I am afraid that if I try to explain these things you will get the idea that I am being highly technical. As a matter of fact the proposition is simple, but calls for the use of a few terms not met with every day. I am going to take the chance of briefly explaining these practical principles with the request that if the explanation seems too involved you gloss over it and concentrate on the rest of the article.

Air humidity means the amount of water there is in the air. One thing to be constantly borne in mind

is the fact that warm air will hold a lot more water than cold air. Air at 70-degree Fahrenheit will, for instance, hold about fifteen times as much moisture as air at zero. Therefore, if you take air at zero which has in it all of the moisture it will hold and heat that same air to 70 degrees temperature, it will then hold fifteen times as much moisture. If you had a certain room full of air which was at zero and the total amount of moisture in the air in the room was one quart, then you raised the temperature of that room to 70 degrees, the air would then hold about fifteen quarts of water.

Now supposing in this room you started in with one quart of water in the air at zero and you raised the temperature to 70 degrees, but you did not add any water. The air while it was at zero would not hold any more water and therefore



Here is the problem as submitted by our reader. The trouble is with condensation penetrating the inner ceilings

\*The Paul R. Jordan Co., Indianapolis, Indiana.

would not absorb any. In other words, it would not dry up anything in the room. But when you raised it to a 70-degree temperature it would hold fourteen quarts more, therefore it would start to absorb water quite rapidly. That means that everything in the room that had the least moisture in it would start drying up. This refers to floors, woodwork, furniture, human beings and everything else.

Now suppose that this room full

water that would collect on it because air touching that surface would naturally get cold and would drop its excess moisture.

This brings us to the definition of the two kinds of humidity, absolute humidity and relative humidity. Absolute humidity is the amount of water or moisture in the air. Relative humidity is the amount of moisture compared to what it will hold. In the room referred to the absolute humidity was one quart of

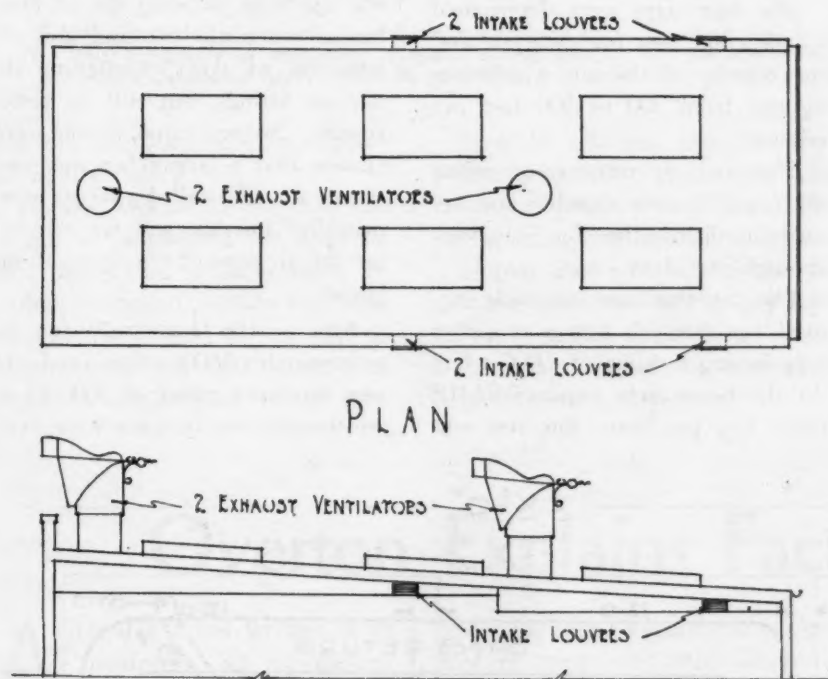
the air compared with what the air will hold. Relative humidity determines the drying power of the air and also how much you can lower the temperature before condensation begins.

In a condensation problem of the kind which now confronts us, we are interested in finding out where the moisture comes from, how much moisture there is, how cold the surface is that is collecting the condensation, and what means we have available for controlling these various elements. In this particular case I have no way of knowing where the moisture comes from, but lacking definite information, would guess that it comes from the apartments below, through leakage and through filtration through the plastered ceilings. The air in the apartments is usually maintained at a temperature of from 70 to 80 degrees, while the air in the roof space is likely to be below freezing in cold weather. The air in the apartment where cooking, cleaning and general house work is going on is likely to be fairly high in relative humidity. Any air that filters up into the roof space from the apartment will carry with it its full quota of moisture because the ceiling is reasonably warm. It is not until this air gets up to the roof that it is chilled sufficiently to begin depositing condensation.

A difficult condensation problem should, if possible, be handled in two ways. In the first place, ventilators to carry away the moisture and in the second place, insulation to relieve the cold surfaces. Ventilation is absolutely necessary because the only way you can get rid of moisture thrown off into the air is to ride it out on exhausted air, replacing the humid exhausted air with drier intaken air. Insulation of cold surfaces is necessary in extreme cases, but ventilation alone will often handle an ordinary condensation problem.

In the present case I judge that further insulation would not be practical. The roof, with a layer

(Continued on page 47)



Here is how Mr. Jordan would eliminate the trouble by providing ventilation.  
Read his discussion in the text

of air should absorb one more quart of water. It still would have an absorbing capacity of an additional thirteen quarts, and would still be very dry at 70 degrees temperature. But supposing now that you should allow the room to cool off until it got back to zero again. At a 70-degree temperature with two quarts of water the air was very dry, but at zero it would be very moist because it would at that time have one quart more than it could possibly hold. Therefore as the temperature approached zero the water would begin to be squeezed out of the air and deposited on any convenient surface. The colder the surface the greater the amount of

water when the temperature was zero, two quarts when the temperature was at 70 degrees. The relative humidity with one quart at zero was 100 per cent because it is saturated with all of the water it will hold. The relative humidity with two quarts of water at 70 degrees was about 14 per cent because at 70 degrees it was only carrying two quarts of water compared to the fifteen quarts that it would hold. It therefore had two-fifteenths of saturation, or about 14 per cent.

In practically every situation you will meet with, the only kind of humidity you will be interested in will be relative humidity; in other words, the amount of moisture in

# Here's a Hot Fan Problem— Let's Have Your Suggestions!

**H**ERE is a problem for you fan enthusiasts. The contractor is having trouble and he invites help. Look over the drawings and read what he says.

If you feel you could remedy this problem send in suggestions.

The contractor says—

AMERICAN ARTISAN,  
139 N. Clark St.,  
Chicago, Ill.

Dear Sirs:

I am enclosing a plan of a heating system that I installed here recently which is not performing as it should, and am sending it along to you people to see if you can tell me what is wrong.

The furnace is a steel, oil burning furnace with a 24-inch grate, equipped with an automatic oil burner with a rating of 160,000 B.t.u. per hour.

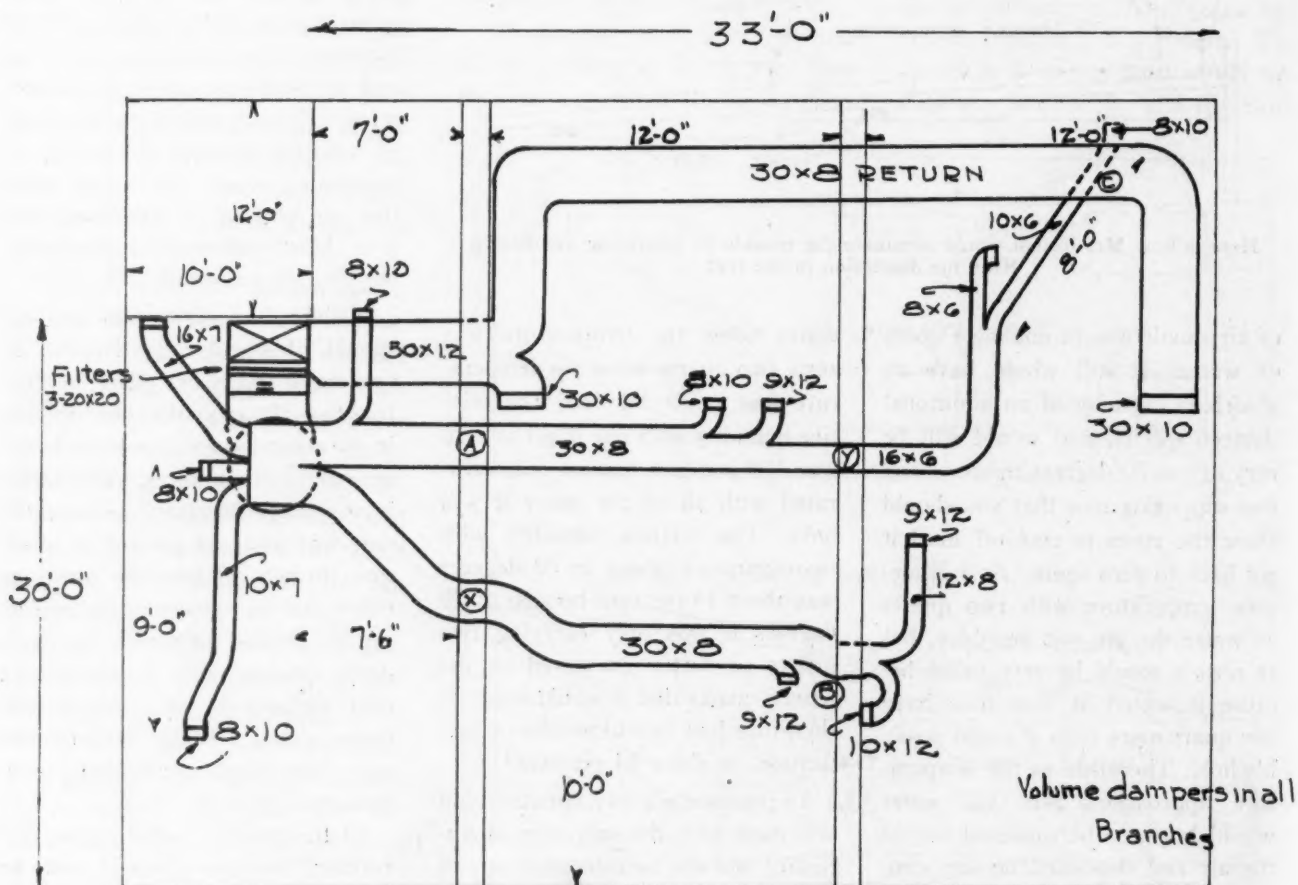
The duct sizes were determined by the cubic feet for each one and the velocity of the air, which was figured from 300 to 500 feet per minute.

The cold air returns, of which there are 2, come together and are introduced to the fan chamber through one duct.

The fan that was originally figured for this job was a propellor type having a rating of 7,000 c.f.m. As the house only requires 92,100 cubic feet per hour, this size was

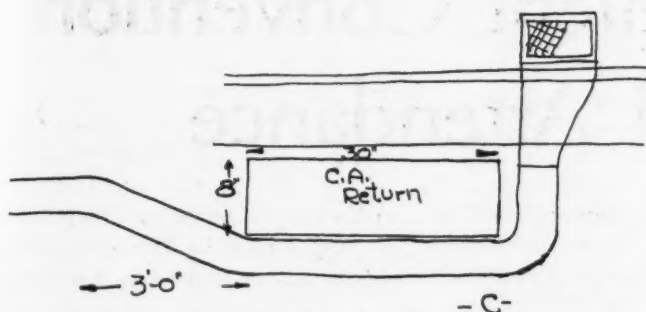
thought to be ample, but during the first three weeks of operation we found that this fan was not working as it should, so we examined the plant to see if there was anything blocking the air flow, but as we could not find any obstruction we tried redesigning the various fittings, but still no better results. So we came to the conclusion that a larger fan was necessary so we installed a larger sized propellor fan but still we couldn't get the air toward the front of the house.

Now as the house calls for approximately 1600 c.f.m. and the new fan has a rating of 3000 c.f.m. we thought our troubles were over,



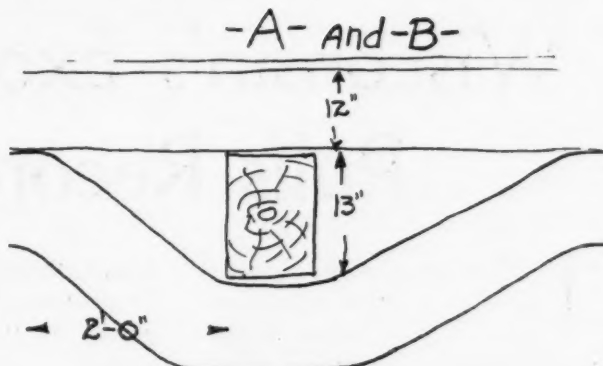
The system is comparatively simple in design. Three large trunks and three smaller ones are used. What do you think is holding up the air flow?





Detail-G-  
Showing Method of Running  
W.A. Duct under C.A.

This is a detail of the return air and warm air ducts at C. The contractor is somewhat doubtful of his frictional resistance here. What do you think?



Typical Detail at  
A and B of Plan

At A and B the warm air ducts had to be dropped under one of the supporting beams of the house. Do you feel that this construction impairs air flow here?

but the plant still does not operate as it should.

As you will see on the plan this is not a complicated job and the only places that probably cause an undue amount of friction are those marked A, B and C, but still it seems as if the 3000-c.f.m. fan should be able to take care of this.

Now if you can give me any pointers on this plant that will cause it to perform as it should, I'd appreciate it very much.

Hoping that you will be able to give me a solution to this problem at your earliest convenience as it is necessary that I do something here at once, I remain,

Yours for "Better Warm Air Heating,"

Now all you fan hounds get busy and let us have your comments and suggestions. This is a nice problem and it ought to hit a lot of you just about right.

Let's have sketches, too.

## Overton Explains Factor 48.96

A READER has written in to inquire for an explanation of the factor 48.96 as given in the article "Factory Heating" in the AMERICAN ARTISAN of October 11, 1930.

As explained, the c. f. m. required is the B. t. u. loss for the room divided by the factor 48.96. This factor is derived from the equation:

$$48.96 = \frac{0.24 \times (t_1 - t_2) \times 60}{0.068}$$

where

0.24 = specific heat of air.

$t_1$  = inlet or temperature at grille.

$t_2$  = room temperature to be maintained.

60 = minutes in one hour.

0.068 = weight of one cubic foot of air at 120 deg.

Where we maintain a room temperature higher or lower than 70 deg. the value of  $t_2$  is changed, and

where the inlet temperature is lowered or raised the value of  $t_1$  is changed. Changing of the inlet temperature ( $t_1$ ) would change the weight of one cubic foot of air at 120 degrees (0.068) to the weight at the temperature desired.

Let us say that we desire to establish a factor for the determining of the c.f.m. in a room to be maintained at 75 deg. with an inlet temperature of 100 degrees. Our problem then becomes:

$$\frac{t_1 - t_2}{t_1 - t_2} \times .24 \times (100 - 75) \times 60 \times 0.0709 = 25.52 \text{ for our factor}$$

120 degrees has been established in heating and ventilating practice as the maximum inlet temperature. However, in some installations, such as machine shops, foundries, and large industrial plants, temperatures of 140 deg. are practical.

In heating large auditoriums, churches, theatres, etc., 120 de-

grees is too high, and inlet temperatures not higher than 15 or 20 degrees above room temperature are necessary.

It is obvious that as we raise ( $t_1$ ) our c.f.m. will become less, and the designer or engineer is cautioned to study the requirements and conditions before establishing the above factor as constant.

Where the C.F.M. is fixed by laws of the state such as in Ohio, Wisconsin, Michigan, etc., we find the inlet temperature by the equation:

$$t_1 = \frac{\text{B.t. u. Loss}}{\text{c.f.m.} \times 1.07} + t_2$$

Hence, if we have a room requiring 1500 c.f.m. and 70 deg. room temperature and a B. t. u. loss of 30,000 we have:

$$\frac{30,000}{1500 \times 1.07} + 70 = 88.69 \text{ for } t_1$$

# Wisconsin's Excellent Convention Pulls Record Attendance

**T**HE program of the Wisconsin Master Sheet Metal Contractors Association Seventeenth Annual Convention, which was held February 2 and 3 at the New Pfister Hotel, Milwaukee, Wisconsin, was indeed well planned.

Monday morning the directors held their annual meeting and at 10:30 President Henry Guessenhainer introduced Wm. F. Eichfeld, President of the Milwaukee Association of Commerce, who extended the official welcome of the city of Milwaukee.

## Monday Afternoon

The first speaker on the program was P. D. Wood of the Trade Association Service Company, Pittsburgh, who spoke on "Your Business Records." Mr. Wood said that his company made a survey for the National Sheet Metal Contractors Association in regard to the bookkeeping needs of sheet metal contractors.

He stated that one man who had conducted a sheet metal shop for over 20 years was no more than a failure until four years ago, when he finally discovered the simple secret of Overhead. Now, Mr. Wood said, this man employs 30 to 40 men the year 'round.

Mr. Wood claimed that his company's representatives in a survey of 40 shops in one large city found that the average overhead was 101 per cent on productive labor.

Contrary to general opinion, Mr. Wood claimed that in all their investigations in all fields it has been proven that the small business has a larger overhead than the large business.

Mr. Wood demonstrated his points with a stool with the la-

bels, 1, Sales; 2, Management; 3, Production. A pan of water placed on the table represented profits.

"This," said Mr. Wood, "represents the one-man shop or the small business. If you are in the habit of working in the shop along with your men you are a fixed part of the production end of your business. As soon as you



Robert G. Suettinger, 1931 President

go out of the shop to figure a job or talk to a prospect regarding a furnace you put yourself on the sales staff. When you leave the shop to sit at your desk to dictate letters or pay your bills, you are working on the management end of your business."

As Mr. Wood talked he took out one leg at a time and said that with any leg missing the water or profits started running away unless the correct prop or proper overhead was put in to take care of the situation.

Following Mr. Wood's talk and demonstration, Mr. C. F. Warning of Oshkosh, Wisconsin, a successful sheet metal contractor and a member of the Wisconsin

Association, spoke on "Overhead as Applied to My Business." This address is published in this issue.

## Election of Officers

Otto Guessenhainer, Chairman of the Nominating Committee, brought in the nominations for officers:

Nominations were called for from the floor, but nominations were closed on motion and Secretary Paul L. Biersach was instructed to cast a unanimous ballot for the entire list of officers.

## Monday Evening Entertainment

Several times during lulls in the business both President Guessenhainer and Secretary Biersach called attention to the Mirth, Song, Entertainment and Refreshments to be dispensed in the Rathskeller on Monday evening. First the assemblage was entertained by a "Little Theatre" group of players who put on a comedy farce concerning the daily life of a small town newspaper editor. The actors were good and the crowd thoroughly enjoyed the show.

Immediately following the show President Guessenhainer, on behalf of the Association, presented Miss Goethel with a gift in appreciation for her work for the Association.

There was community singing, solo singing and refreshments of hot dogs, cheese, sandwiches, coffee and beer. After this came the dance.

## Tuesday Morning

The first speaker Tuesday morning was George Hayden of the Wisconsin Rating and Inspection Bureau, Milwaukee, who spoke on "What Is Your Compensation Insurance?"

"Not until the invention of the

steam engine," said Mr. Hayden, "was any great impetus given to the movement. As the era of manufacturing took greater strides, accidents grew, and many of these were taken for granted, the assumption of risk being understood."

"The first laws on this subject were known as Employers' Liability Laws. After the failure of these laws several state enacted Workmen's Compensation Laws, and the movement steadily grew until now it is general throughout the country."

Mr. Hayden explained in detail how rates were arrived at.

Bennett Chapple, Vice-President, American Rolling Mill Company, of Middletown, Ohio, was the next scheduled speaker, but through unavoidable circumstances he was unable to be present.

His place on the program was filled by Bennett Chapple, Jr., Executive Secretary of Armco Distributors Association, who spoke on the subject of "Let's Talk Over Business." Excerpts of Mr. Chapple's speech are reprinted in this issue.

#### **Tuesday Afternoon**

The gathering was treated to

### **1931 OFFICERS**

**President—Robert G. Suettinger, Two Rivers.**

**1st Vice-Pres.—Louis Reinke, Milwaukee.**

**2nd Vice-Pres.—George Bishoff, Marinette.**

**3rd Vice-Pres.—William Gehrke, Sheboygan.**

**4th Vice-Pres.—J. Birthrong, Waukesha.**

**5th Vice-Pres.—Adolph Schuman, Milwaukee.**

**Secretary-Treasurer—Paul L. Biersach, Milwaukee.**

two interesting and instructive moving pictures, the first that of the American Brass Company, their film "From Mine to Consumer," the story of how copper is mined, made and used, was shown, and the other "Making It Tough," shown by the Republic Steel Corporation, showing the making of alloy steels.

Platte Overton, Consulting Engineer, of Chicago, was the final speaker of the program and his subject was "The Design of Sheet Metal Ducts in Connection with Air Conditioning."

Before starting his talk, Mr. Overton had distributed blueprints of the heating system,

showing the duct system he was going to explain.

"This duct system," said Mr. Overton, "is laid out to resistance and not to capacities, and all your duct systems can be planned likewise and just as simply, as I will explain the layout of this system."

"An important and desirable feature of designing a duct system in this manner is the absence of volume dampers."

Mr. Overton took the plan and with the aid of the blackboard figured and sized the entire duct system in a few minutes. The tables and graphs, he explained, were not only on these sheets but can also be found in the National Association's big book, "Standard Practice in Sheet Metal Work."

So valued was Mr. Overton's contribution to the convention that a standing vote of thanks was given him at the conclusion of his talk.

#### **Tuesday Evening Banquet**

The annual banquet was held in the Crystal Room of the New Pfister Hotel.

This was a dinner-dance between courses. Paul L. Biersach was the toastmaster and Douglas Malloch the speaker of the evening.

## **LET'S TALK OVER BUSINESS**

**T**O the best of my knowledge during the past twelve months there has been no more appropriate time than the present to talk business over.

There is no need to tell you of the trying year we have just experienced. Already it is history and too late to do anything about it even if we could. It is interesting to know, however, that a review of history shows that at almost regu-

**By**  
**BENNETT S. CHAPPLE, Jr.\***  
*Executive Secretary, Armco Distributors Association*

lar intervals similar periods of economic stress have appeared.

During the prosperous years in between these periods of depression we are all so busy filling orders, keeping production up, enjoying ourselves and generally being entertained that we haven't time to try out ideas and experiment with new ways of doing things.

For an interesting example, let's just take a look at the iron and steel industry. When and where has real progress been made?

#### **Continuous Sheet Rolling**

Outstanding, of course, in later years, has been the development of the continuous method of rolling sheets. Did you know that this tremendous accomplishment, the outstanding development of three centuries, was actually first placed in operation during the depression of 1920 and 1921?

\*Address before Wisconsin Master Sheet Metal Contractors' Association convention.



John B. Tytus of Middletown, Ohio, its designer and inventor, first conceived it himself 14 years earlier. He will tell you that he didn't have time to fully develop what has now turned out to be one of the major contributions of this generation to the progress of the world.

Some of you perhaps will remember the introduction of the first automobile. It also came during an earlier period of readjustment.

Laughed at, at first, it has brought with it during the past 30 or 35 years a general periodic increase of prosperity unequaled in the history of the world. Without the automobile the great oil industry of today would probably not be here. Most certainly the glass industry owes its development to the horseless carriage. And the rubber industry surely would not be where it is today without the ever-increasing demands of the automobile.

As its development increased, comforts became imperative. The paving industry perked up its head, thousands of miles of brick, asphalt and concrete highways soon networked our nation. And last but not least, the production of iron and steel sheets was stimulated as never before in its history.

#### Depressions Are Godsend

Depressions are really a godsend in disguise, and because of that 1931 should be a splendid year for most of us, provided we get out and sell. The day of waiting for business to come to us has passed and now we must go and get it. Never before has the "salesman" had placed on his shoulders the responsibilities of today. Heretofore he has generally only had to be an order taker. Now, production efficiencies have created capacities in excess of demands, and the salesman has become the key to the whole situation. Nineteen thirty-one is a selling year.

This is not an original idea. One has only to refer you to the pages of your trade press and to other speakers whom you may have heard

for you to recognize the nationwide movement on foot. The necessity of "better selling" is recognized today by all industry.

When a man today decides to build a \$10,000 residence he takes nothing for granted. What follows?

First of all you have the industries of our country, the brick industry, the metal industry, the concrete and wood industries competing actively against each other for the major portion of that \$10,000. The most powerful sales weapons of each group are brought to bear in an effort to convince the prospective home owner of the superiority of one type of industrial product over the other. Here is where associations such as yours, and your National Association with which the Wisconsin State Sheet Metal Contractors Association is affiliated, must play their part. It becomes a problem of the iron and steel sheet metal industry against the world.

When this point has been settled, it is then time enough to exploit the workmanship and artisanship of individual contractors and the qualities of the different grades of metals they use. May the job ultimately go to the most deserving, but we must recognize our major problem and not let individual competition, one with the other, befuddle us to the extent that some other industry makes the catch.

Perhaps you are thinking—there's not much sheet metal on a residence. Some gutters and downspouts, some valleys and perhaps ridge roll and a furnace pipe or two. They'd hardly use brick or wood or concrete for that, we'll get it anyway. If you feel that way, you're forgetting about progress.

#### New Uses for Metals

Are you acquainted with the new uses for sheet metal? Some of them can well become parts of your own business. For example, have you heard of the porcelain enamel on metal "colored" blackboards?

How many of you gentlemen have kept pace with the develop-

ment of the metal house and metal lumber? These things are just around the corner. Already many have been successfully built and it does seem rather foolish when we think that the average man goes down town to do his business in a modern fireproof building and leaves his most precious belongings behind him in a frame or inflammable interior house.

Are you familiar with the great progress made in the past few years in heating and ventilating and air conditioning? All of these things take sheet metal and require the services of trained artisans.

There is another new application, even closer to home than the rest. Many of you read the story in the December issue of the *Ingot Iron Shop News* on "Waterproofing Basement Walls With Sheet Metal."

That article tells of a residence costing \$6,000 in which over 1½ tons of 18-gage rust resisting Armco ingot iron corrugated sheets composed the outside form against which concrete was poured and when left in the ground these sheets formed a waterproof shell through which even an actual head of water could not penetrate. And most surprising of all—due to its ease of installation and the speed with which it was installed, actual cost records showed it to be considerably less expensive than double wood forms and almost as cheap as single. This without any extra cost for waterproofing.

#### What Will You Do?

What are we going to do about it? These things are not only practical, but they are either actually here or coming very shortly. If we do not recognize their value and swing into line, someone else most certainly will.

"Better selling" methods are imperative. No longer is the job one for the mill or the distributor or the sheet metal contractor. Now it becomes a problem involving all three in their approach to the general public.

The old way of selling must be

discarded. No longer can a mill salesman visit a jobber, secure an order for a carload of sheets, see that they are delivered and consider the transaction closed. No longer can the distributor sell a few thousand pounds to the sheet metal contractor, see to its delivery and then consider the transaction closed. Now, in modern selling it becomes the job of the mill representatives to not only deliver the carload of sheets to the distributor, but in turn to assist him in turning the metal over to the sheet metal contractor. Well he knows that it is impossible for him to secure additional orders from this jobber until that material already supplied him has been moved. In turn, neither can the distributor salesman consider his transaction closed upon the delivery of metal to the sheet metal contractor. He must step in and assist the sheet metal contractor to pass on this material to the general public.

Here is a good example of "better selling." In the state of New Jersey a sheet metal contractor was called in to repair a leaking downspout. It was a small job requiring only a length or two of pipe, a little solder, and a short period of time. While repairing it, he took occasion to inspect other sheet metal work in the residence when the job was completed—this sheet metal contractor directed the attention of his customers to the neatness of his work. Then quite casually he remarked, "There's a gutter on the side porch and two sections on the back of the house that are in poor condition. Hadn't I better repair them before they leak?"

Next came the suggestion of a sheet metal mop and broom holder for the head of the cellar stairs. That also was approved. Then a new furnace pipe, a sheet metal border for the flower beds and a sheet metal receptacle in which to burn paper and trash. Shortly afterwards he recommended a sheet metal pan to catch the grease and oil that dripped from the car and, finally, best of all, a new roof for the garage.

### \$7,700 HEATING SYSTEM

(Continued from page 23)

halls connecting with these rooms has sufficient return area to take care of the connecting rooms.

On the third floor there are four small bedrooms and one bath receiving heat. In practically every case the register and stack are not continuous, but are connected through a floor duct.

All of the bedrooms are equipped with baseboard registers, and return air is provided through grilles located in the hall. One of the construction features of interest is the fact that all exterior walls of the house are built of cinder concrete block. It was necessary to put the stacking in place as the walls were built up, and once this stacking is encased it will be practically inaccessible.

One of the features which enabled Mr. Schwartz to sell this expensive heating system was the fact that the owner was much interested in the possibility of summer cooling. Adequate filtration is provided by the use of some three to five sections of Reed filter in each housing. The blowers are of such capacity that it will be possible to provide a noticeable circulation of air in all of the large rooms of the house.

### SELLING THE JOB

(Continued from page 35)

spells PROFIT. What we got without effort spoiled the whole crowd, and that extra effort and thought which we neglected and gave to large companies was the profit we should have had. And OH! boy, how two or three I know off hand are plugging for a better 1931, and getting it so far. They have tasted the modern way of doing business and liked it, and unless I miss my guess, never will return to the "waiting for it to come" attitude.

AND EVERY SHOP CAN DO THE SAME IF IT WANTS TOO.

All we need to do to be convinced is to sell a job at a higher

figure than a competitor, and get the thrill for doing business right.

Nineteen Hundred and Twenty-eight and even earlier in some instances was a gradual decline and you know why. 1930 showed what must be done.

Nineteen Hundred and Thirty-one is our chance. LET'S GO.

### MOISTURE CONDENSATION

(Continued from page 41)

of sheeting solid and reasonably tight, is perhaps as well insulated as the average roof. The amount of moisture actually coming into the roof space is probably not great, but having no way to get out it must eventually collect on the roof, where it may freeze at night and then with the daytime sun heat added to the internal apartment heat, melt and drip. A normal amount of ventilation will probably take care of this. Not knowing the dimensions of the roof space I cannot give ventilator sizes, but I can give you a layout providing for intakes and exhausts. A stationary ventilator may handle this, although I would recommend a rotary. If Mr. Cramer will give me the dimensions of the roof space, I will be glad to give him ventilator sizes and explain to him just how I figured it.

It seems, from the drawing I have, that the roof space is divided into two parts, one part at the front and one part in the rear. One ventilator and two intake louvers will handle each part of the roof space. The ventilator should be set in the middle of the highest portion of each of the respective parts of the roof space. The intake louvers should be set one on each side of each part, as far back as construction will permit. I believe my drawing makes this clear. The layout, as shown, is simple and, unless there is some condition on which I am not informed, will be effective. The expense furthermore will be nominal, even though the contractor figures himself a reasonable profit.



# AN YOU TELL ME ?

## Retinning

From Emil Knain, Northwood, North Dakota.

Please tell me who makes equipment for retinning creamery vats.

**Ans.**—Retinning Manufacturing Company, 3021 Greenview Avenue, Chicago, Illinois, and Hopwood Retinning Company, Chicago Heights, Illinois.

## Stokers

From Terry Whalen & Associates, Bloomington, Illinois.

What firms make stokers for furnaces?

**Ans.**—List mailed.

## Repairs for Reliance No. 150 Furnace

From Waterman - Waterbury Manufacturing Company, Ltd., Regina, Sask.

Where can we get repairs for the Wm. Buck No. 150 Furnace made at Brantford, Ontario?

**Ans.**—Happy Thought Foundry Co., Ltd., Brantford, Ontario, Canada.

## Wants Regulating Handle for "Little Draftman"

From Gresley & Company, Port Huron, Michigan.

We would like to secure a regulating handle for the "Little Draftman" regulator. Can you refer us to some one?

**Subscribers:** Can any of you help out a fellow reader?

## "Fuller" Slitting Shears

From The Farber Company, Pawtucket, Rhode Island.

Can you tell us who makes "Fuller" slitting shears?

**Ans.**—Otis L. Fuller Company, Goshen, Indiana.

## Backdraft Louvers

From The Bryant Heater and Manufacturing Company, Philadelphia, Pennsylvania.

Who manufactures backdraft louvers?

**Ans.**—Refer to American Foundry and Furnace Company, Bloomington, Illinois, and The A. H. Lumm, Inc., of Toledo, Ohio.

## Repairs for "Standard" Furnace No. 80

From R. J. Reichenbach, Bay City, Michigan.

Where can I secure repairs for a "Standard" Furnace No. 80. The only mark on it is Akron, Ohio.

**Ans.**—The Wise Furnace Company, Akron, Ohio.

## "Robinson EveryDuty" Fan

From Fred H. Glass, Chicago.

Who in Chicago jobs the "Robinson EveryDuty" Portable Fan, made by The A. H. Robinson Company?

**Ans.**—Carr Supply Company, 414 North Dearborn Street.

## Address of Carrier-Lyle Corporation

From H. Sabathne & Son, Altoona, Pennsylvania.

Where is the Currier Engineering Company, makers of "Manufactured Weather," located?

**Ans.**—This firm is Carrier-Lyle Corporation, 850 Frelinghuysen Avenue, Newark, New Jersey.

## Water Tanks

From Mentor Sheet Metal Shop, Mentor, Ohio.

Who manufactures tanks of 500 to 1,000 gallon capacity, suitable to haul water with by trucks?

**Ans.**—Johnson & Carlson, 848 Eastman Street; Ajax Tank & Tower Company, 1456 West 38th Street; Fairbanks, Morse & Company, 900 South Wabash Avenue; the Challenge Company, 333 North Michigan Avenue; Eagle Tank Company, 2440 North Crawford Avenue; Chicago Boiler Company, 1967 Clybourn Avenue; all of Chicago.

## Furnace Vacuum Cleaners

From H. K. Tweedell, Calumet City, Illinois.

Who manufactures furnace vacuum cleaners?

**Ans.**—Brillion Furnace Company, Brillion, Wisconsin; the Kent Company, Inc., Rome, N. Y.; National Super Service Company, Toledo Factories Building, Toledo, Ohio; B. F. Sturtevant Company, Hyde Park, Boston, Massachusetts; Densmore & Quinlan, Kenosha, Wisconsin.

## German Silver

From Weissmiller, Armstrong, Geniesse Company, Green Bay, Wisconsin.

Where can we buy German silver?

**Ans.**—Scovill Manufacturing Company, 1229 West Washington Boulevard; the American Brass Company, 1326 West Washington Boulevard; both of Chicago.

## Electric Sign Specialties

From I. C. Allebaugh, Spencer, Iowa.

Who manufactures electric sign specialties, such as illuminating letters, etc.?

**Ans.**—Friedley-Voshardt Company, 733 South Halsted Street, Chicago, Illinois.

## Glass Letters for Electric Signs

From Osakis Heating & Sheet Metal Works, Osakis, Minnesota.

Who manufactures glass letters for electric signs?

**Ans.**—Chicago Miniature Lamp Works, 654 West Lake Street; Opalite Sign Company, Inc., 201 East Ohio Street; George Steere & Sons, 434 South Dearborn Street; all of Chicago.

## Machines to Make Ozone

From W. H. Sloan, Toledo, Ohio.

Who manufactures a machine to make Ozone?

**Ans.**—Interstate Electric Company, 4339 Duncan Avenue, St. Louis, Missouri; United States Ozone Company, 500 North Dearborn Street, Chicago, Illinois; Charles A. Branstion, Inc., 299 Ellicott Avenue, Buffalo, New York; Ozone Pure Airifier Company, 1455 West Congress Street, Chicago, Illinois; Air Conditioning and Engineering Company, 2914 South Jefferson Avenue, St. Louis, Missouri.

## Sheet Metal Already Coated

From Dingler Sheet Metal Works, South Milwaukee, Wisconsin.

Where can we procure sheet metal already coated that can be used for filing cases and office fixtures?

**Ans.**—Invincible Metal Furniture Company, Milwaukee, Wisconsin; Lyon Metal Products Company, Aurora, Illinois.



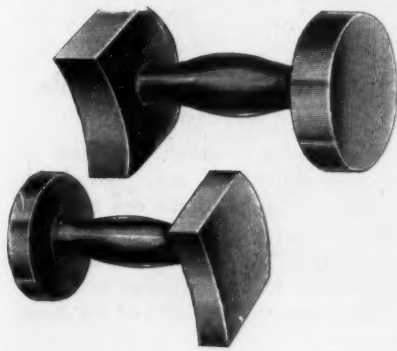
# NEW ITEMS and NEWS ITEMS

## From and about the Manufacturers and Jobbers

### Whitney Metal Tool Co. Markets New Dollies

The Whitney Metal Tool Company, Rockford, Illinois, announces they are now prepared to distribute two new hand dollies suitable for the sheet metal trade.

The large dolly is intended for the shop and weighs seven and one half pounds. The smaller dolly weighs



three pounds and will fit in any mechanic's tool box.

Both dollies are designed to be used in seven positions and will not roll when laid lengthwise on the bench.

Both dollies are drop forged, machined surface and hardened.

Literature will be sent to anyone writing the company.

### Round Oak Co. Succeeds Old Concern

Announcement was made recently that the manufacturing and sales divisions of the Beckwith Company, Dowagiac, Michigan, one of the oldest producers of furnaces, stove and ranges, have been absorbed by a re-organization under the head of the Round Oak Furnace Company of the same address. The Round Oak Furnace Company ownership and personnel is identical with that of the Beckwith Company.

The new company will continue to produce Round Oak specialties as heretofore and they express the opinion that the new company's present and future program warrant continued patronage.

Officers of the new organization are as follows: F. E. Lee, Chairman of the Board; W. J. Fickinger, President; Rene S. Walker, Secretary; Harry C. Mosher, Treasurer; Bruce E. Gollan, Sales Manager; John F. Nugent, Assistant Sales Manager; Frank N. Parker, Advertising Manager; Frank H. Arndt, Production Manager.

### Friedley-Voshardt Making Cast Aluminum Letters

The Friedley-Voshardt Company of Chicago are now making a cast aluminum sign letter for electric signs.

According to the manufacturer, the letters may be dropped from the height of a marquee without damage. The letters are light, rust proof, easy to handle because of their lightness and give a clearcut visibility during day-time when lights are not on.

The letters at present are handled in two sizes, 9-inch and 12-inch with a selection of four assortments for each size.

The company will be glad to send prices and descriptive literature to any one interested.



Ohio Sheet Metal Contractors' Association—February 17, 18 and 19, Deshler Hotel, at Columbus, Ohio. J. M. Saunders, Secretary, 215 Plymouth Building, Cleveland, Ohio.

Missouri Sheet Metal Contractors Association—February 24 and 25, in Hotel Statler, St. Louis, Missouri. Luke Tiernan, Jr., Secretary, 4242 West Pine Boulevard, St. Louis, Missouri.

Michigan Sheet Metal and Roofing Contractors—March 3, 4, 5, 1931, at Saginaw, Michigan. Frank E. Ederle, Secretary, Hotel Detroit, Detroit, Michigan.

Sheet Metal Contractors' Association of Pennsylvania—March 9, 10, 11, 1931, at Hendler Hotel, Johnstown, Pennsylvania. M. F. Liebermann, Secretary, 1411 Merchant Street, Ambbridge, Pennsylvania.

Sheet Metal Contractors' Association of Florida—March 30-31, 1931, at Miami, Florida. G. H. Leavitt, Secretary-Treasurer, 909 Main Street, Tampa, Florida.

National Warm Air Heating Association—April 22 and 23, 1931, at Deshler-Wallick Hotel, Columbus, Ohio. Allan W. Williams, Managing Director, 3440 A. I. U. Building, Columbus, Ohio.

Joint Convention Sheet Metal Contractors' Association of Illinois and National Association Sheet Metal Contractors—May 12-15, 1931, Congress Hotel, at Chicago, Illinois. A. B. Rysdon, Secretary, Associated Sheet Metal Employers of Chicago, 350 North Clark Street, Chicago, Illinois.

### Ryerson Acquires Kemp- smith Line

Announcement has been made that effective January 1st, Joseph T. Ryerson & Son, Inc., Chicago, acquired the lines of Maximillers, Production Millers and Automatic Indexing Machines heretofore produced by Kemp Smith Manufacturing Company of Milwaukee. The transfer involves an outright purchase of good will, patents, patterns, inventory and other assets pertaining to these lines.

Mr. A. C. Bryant, General Manager Machinery Division of the Ryerson concern, advises that his Company will act as general distributors of the line, direct the sales policy and furnish, through a special engineering staff, including Mr. Walter Mickelson, formerly associated with Kemp Smith, the necessary services to the trade and support to its local sales agencies in the active promotion of these machine tools.

### Ke-Ro-Co Making New Heat Circulators

The Ke-Ro-Co Heater Company, Inc., Oakland, California, is now marketing two types of heat circulators—a floor heater, which is suspended to the first floor joists, and a room circulator.

The Ke-Ro-Co Heat Circulator is of the internal combustion-multiple heating element principle. The heating element is made of heavy gauge rust-resisting ingot iron welded at every seam and joint. Circular warm air passages extend through the center of the element to increase the heating surface and circulation of warm air. Heat, rising from the burner, travels upward, around and over two baffles, thoroughly and evenly heating the entire element. All products of combustion are discharged through a vent outlet.

A sheet metal lining surrounds the heating element and the outer case of the heater.

A specially designed and approved blue flame type burner is used which extends the entire length of the heating element and has a simple adjustment for either natural or artificial gas.

The exterior is made of special furniture metal which takes a high finish, enriching the appearance of the heater.

### Independent Air Filter Co., Chicago, Announces New Dry Fabric Filter

"Compact" is the name of a new air filter just placed on the market by Independent Air Filter Company, 29 South Clinton Street, Chicago.

The name is somewhat descriptive, implying the use of many folds of a dry filter fabric in compact form. An unusually large filtering area is thereby provided, resulting in very low velocity through the medium. This, in turn, insures low resistance and long useful life of the medium. The fabric used is highly efficient in stopping the minute particles of dust present in a domestic re-circulating system. The extensive filtering area provides large dust holding capacity and in the average home system will not require servicing oftener than once in a season.

The filter housing is adapted in size and shape to the housing of the usual type of blower used in modern warm air systems. In standard practice the filter will set directly above the blower so that the return air of the heating system will be thoroughly cleaned before being discharged to the furnace casing. When servicing is necessary the filter element is simply pulled out of its housing—for all the world like the drawer of a filing cabinet. The soiled fabric is dropped out and clean material fed in from the supply roll. The whole job is done in a few minutes without soiling the hands, and the filter element is slid into the housing ready for another period of service.

The Independent Air Filter Company is a new concern being organized by J. L. Harpham. Mr. Harpham is president and general manager. Q. G. Ewen is sales manager for the Chicago district. The sales organization will be expanded rapidly as possible to make it national in scope.

The company will manufacture and sell a full line of air filtration equipment. The initial product is their "Compact" filter, described in a bulletin just issued. This is a dry fabric filter, the feature of which is an extensive area of filter material in compact form. The filter is adapted for general ventilation, industrial air cleaning, air compressors, Diesel engines and domestic warm air furnaces. Other types will be added to the line later.

### "Book of Facts" on Copper Bearing Sheets

The short history of copper alloy sheets contained in a ten-page booklet being sent to the trade by the Granite City Steel Company of Granite City,

Illinois, should interest every sheet metal contractor.

Chapter Headings are: Alloy Age, Purity vs. Alloy, Exposure-Tests, Cost, and Uses.

Copies of this "Book of Facts" may be obtained by addressing the Granite City Steel Company, Granite City, Illinois.

### Hart and Cooley Announce a New Furnace Regulator

Hart and Cooley Manufacturing Company, Chicago, are now ready to distribute a new heat control which is automatic in operation. The new unit lists at \$45.00 including all the necessary fittings. The company announces that before they began to distribute this unit the most exhaustive tests were made. One regulator was operated 200,000 times, or equivalent to 90 years of service, before they were satisfied that the control would render trouble-free service.

The thermostat, housed in an artistic moulded case, is extremely sensitive, operating on a change of temperature of one degree, and is precision built in every detail—a quick acting thermostat which insures a very minimum of variation in



the room temperature. A special device in the motor to insure years of service with no attention, consists of an additional set of extra heavy, mechanically operated contact points, built into the motor. The electrical circuit is broken by these contact points rather than by those in the thermostat, thus eliminating all pitting.

An illustrated folder is ready for distribution and may be had by writing Hart and Cooley Mfg. Co., 61 West Kinzie Street, Chicago.

### Furblo Announces 1931 Line of New Blowers

The Lakeside Company, Hermansville, Michigan, is now prepared to mail out a catalogue showing the new improved Furblo blowers for warm air heating.

According to the company, more than 1,200 Furblos were installed in 1930. The company engineers have,

however, made many improvements and additions to the line of blowers. The tendency is to make the blower an integral part of the furnace rather than an accessory.

This new catalogue shows the complete line of furnace blowers and contains full data and details for each unit.

In the 1931 line blowers for both straight mechanical and for combination gravity and mechanical systems are included.

Another feature is that the manufacturer absolutely guarantees capacities and static pressure ratings.

Anyone desiring one of these illustrated catalogues may get one by writing the company.

### New Oil Burner Test Code Drafted

The technical research committee of the American Oil Burner Association completed its draft of the test code for testing oil burners and steam boilers at a meeting in New York on October 7, according to an announcement by Harry F. Tapp, executive secretary of the Association.

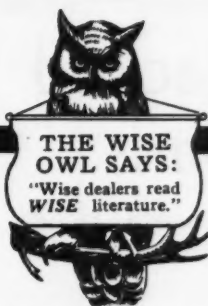
The test code was developed in connection with the research work now being conducted at Sheffield Scientific School, Yale University, by Professor L. E. Seeley. The work is being done in co-operation with the research laboratories of the American Society of Heating and Ventilating Engineers and the American Oil Burner Association.

Members of the committee who participated in the final draft of the code were J. H. McIlvaine, McIlvaine Burner Corporation of Evanston, Ill., chairman; R. W. Beckett, Silent Automatic Corporation of Detroit; Homer Linn, American Radiator Company, New York; Professor Seeley; W. C. Schoenfeldt, technologist of the American Oil Burner Association, and Harry F. Tapp, secretary.

### Correction on Ryerson Purchase

A recent issue carried a news item regarding the acquisition of the stock and good will of the sheet metal division of the Richards Company, Boston, Mass., by Joseph T. Ryerson & Son, Inc.

This article stated that in 1926 the Ryerson Company entered the Boston territory through the purchase of the Penn Metal Company. This is in error, as the Ryerson Company only purchased the reinforcing bar division of the Penn Metal Company.



A  
WISE WARM AIR HEATING SPECIALIST  
WILL WRITE FOR THESE

**BOOKS**

ABOUT THE WISE BALANCED  
LINE "20" "GAS" "40"

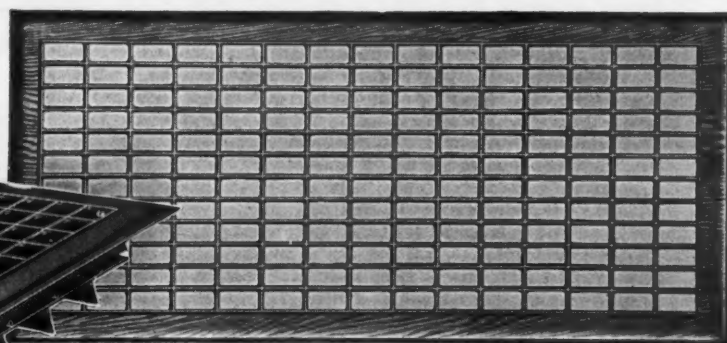
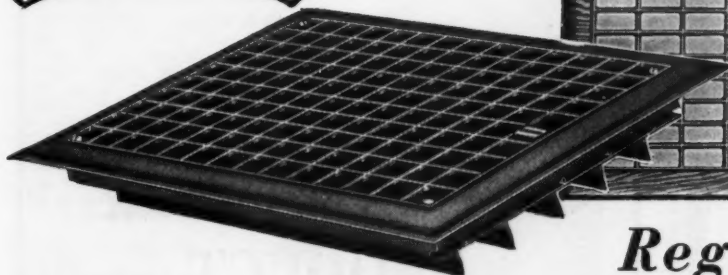


Here are two WISE books which wise dealers will write for. They tell the history and story of over a quarter century of furnace manufacturing. They tell about Gas and how it is fast becoming a popular fuel in warm air heating.

Be wise—write for the WISE booklets No. G2 and No. 24. They are yours for the asking.

THE WISE FURNACE COMPANY

AKRON, OHIO



*Register Satisfaction!*

**NOW! A COMPLETE ROCK ISLAND LINE**

It is with the greatest pleasure that we announce the MODERN Steel Floor Register, for not only did it bring a product of superior value to the trade, but it rounded out and completed the ROCK ISLAND LINE of quality Registers and Faces.

Prove it to yourself! Use the coupon and let us send you our new 1931 catalogues which tells about the famous "NO STREAK" and new "MODERN" registers and ROCK ISLAND faces.

**Register satisfaction! Buy Rock Island.**  
**1931 CATALOGUE IS READY — USE THE COUPON**

ROCK ISLAND REGISTER CO., Rock Island, Ill.

Gentlemen:—

Send me your new catalog which describes in detail your new Steel Floor Register and Steel Cold Air Ventilating Face as well as your full line of Steel Side Wall Registers.

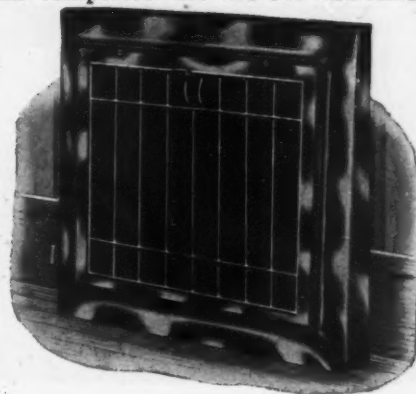
NAME.....

ADDRESS.....

TOWN.....

STATE.....

Mention AMERICAN ARTISAN in your reply—Thank you!





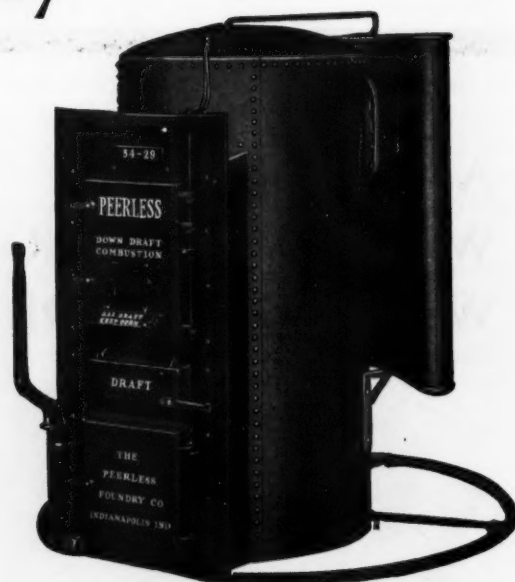
# Install Furnaces Backed By Merchandising Plans

It means more sales, less sales resistance, larger profits and better business foundation. Peerless dealers know this.

## PEERLESS MERCHANDISED- MERCHANDISE ..

Peerless dealers in every city have learned what merchandising means. The Peerless Merchandising Plan is as trim and of the same quality as the furnace it backs. It constitutes a **LOCAL MARKET SURVEY** with proper methods and material to bring a Peerless dealer to the front and make him a leader in the community. Think it over. Are you selling furnaces backed by proper merchandising methods? Will you ever be a leader in your community? Better let us tell you all about **PEERLESS** merchandising plans and lines.

**THE PEERLESS FOUNDRY COMPANY, INC.**  
INDIANAPOLIS, INDIANA



*Peerless Boiler Plate is one of the Peerless built-in quality line. There is also the **Peerless Pleasant Home**, a competitive priced steel furnace—and the **Peerless** built in quality **Cast Iron** at a price that gets the Business.*

Bailey Farrel Mfg. Co.,  
Warehouse Distributors  
Pittsburgh, Pa.

## Furblo

**for 1931**

*a newer—still better*  
**FURNACE BLOWER**

Although Furblo has proven itself a success in every 1930 installation, it is an even finer blower in 1931. Completely redesigned. Enlarged. Improved in every mechanical detail. Three types. Sizes for every installation. Absence of dampers or louvres permits combination mechanical and gravity circulation when desired without troublesome moving parts. Fool-proof. Self-oiling. Capacities arrived at according to standard code of A. S. H. & V. E. and are absolutely guaranteed. Dealers, Jobbers, Manufacturers: Write for further data today.

**Lakeside Co., Hermansville, Mich.** Makers of the Lakeside Ventilating System



## COMING

—a New

# SILENTAIR

## PRODUCT

See American Artisan  
March 2

# SILENTAIR

## CONDITIONING UNITS

Manufactured by

**A. GEHRI & CO., INC.**

Tacoma

Established 1892

Washington

Say you saw it in *AMERICAN ARTISAN*—Thank you!



This one-man outfit makes low overhead

**T**HAT is what one dealer did in 1930 with this Super Suction Cleaner. Another, with only 261 cleanings, sold fifty-two new furnaces. Does that sound good to you?

There is plenty of business for hustling owners of these speedy, one-man outfits. Make 1931 your banner year. Start today, book cleaning, spot repair work and line up live prospects for new furnaces.

Our Plan Book—free for the asking—tells how to get quick action on these new profits and keep your shop busy all year.

**THE NATIONAL SUPER SERVICE CO.**  
1954 North 13th Street Toledo, Ohio

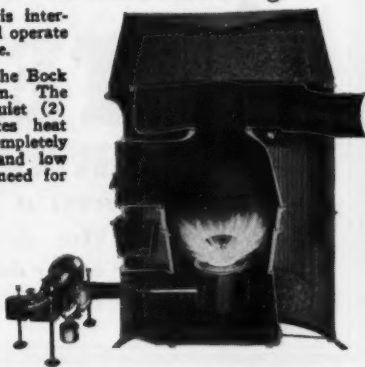
## The Bock Oil Burner for Warm Air Furnace Heating

Every one of your customers is interested in an oil burner which will operate efficiently in a warm air furnace.

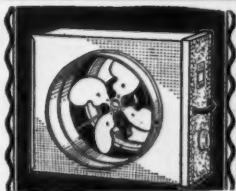
The constant flame principle of the Bock insures such efficient operation. The Bock is (1) dependable and quiet (2) extremely simple (3) distributes heat evenly to all castings (4) completely automatic, and (5) its high and low flame operation eliminates the need for electrical ignition or gas pilot.

The Bock solves the problem of efficient oil heating in a warm air furnace. Write for details.

**The Bock Oil Burner Corporation**  
Madison Wisconsin



**A-C** Thermostatically Controlled  
**Automatic HEAT BOOSTER**



## Easy to Sell—Easy to Install

Here is the furnace fan that is making money, extra sales and Better Heating Jobs for live warm air heating men everywhere. Its attractive price and high efficiency make it a big favorite with the trade.

It's complete, too—Heat Booster, Fan and Unit Housing and Mercury Control. You install it in a few minutes in any kind of cold air arrangement.

Order from your Jobber—or write direct for full details.

**A-C MANUFACTURING COMPANY**  
417 SHERMAN AVENUE PONTIAC, MICHIGAN

## Balanced Heat Is the Ideal Method of Home Heating

**T**HE McIlvaine Oil Burner, with its continuous flame, automatically governed, maintains a uniform temperature in the home regardless of outside weather conditions. Thermostatic control automatically governs the flow of both oil and air.

The house is not alternately overheated and chilled, because the McIlvaine Continuous Flame is automatically adjusted to a size that will maintain an even temperature at all times. There is no pilot light—no electric ignition—no intricate starting and stopping devices to get out of order. There is no waste through alternately forcing the heating system and cooling it off again.

### McIlvaine Oil Burners

are made in a range of sizes to meet practically every requirement. They have been installed since 1924 in all types of boilers, furnaces and hot water heaters, and have thoroughly demonstrated the superiority of the McIlvaine method of continuous operation.

**McILVAINE**  
**BURNER CORPORATION**

747 Custer Avenue, Dept. A, Evanston, Ill.



## Write for This FREE BOOK

which explains the McIlvaine method of Balanced Heat—the McIlvaine 1931 Sales Plan and special proposition to dealers in territory where we are not represented.

## MAIL THIS COUPON!

McILVAINE BURNER CORPORATION,  
747 Custer Avenue, Dept. A, Evanston, Ill.

Send me, without obligation, your book, "Balanced Heat"—Sales Plan and proposition to dealers—

Name.....

Street.....

City.....

State.....

Mention AMERICAN ARTISAN in your reply—Thank you!

B

## “LECTROMELT”

A

### NEW PROCESS

TO INCREASE

### BRILLION LEADERSHIP

The warm air heating industry in improving and advancing. BRILLION must keep its leadership. That is why we have installed the new LECTROMELT process, insuring stronger castings that withstand repeated heating 50% better.

LECTROMELT produces a grey iron casting more uniform and more dense than any other system, and, above all, LECTROMELT gives positive control of the molten material during the casting process. Such is the quality which makes a BRILLION furnace LECTROMELT processed.



### Brillion Two-Piece Radiator LECTROMELT Processed

Notice the sturdiness of construction of this BRILLION furnace—massive and embodying every important feature for satisfaction and easier selling—and now made by the LECTROMELT process.

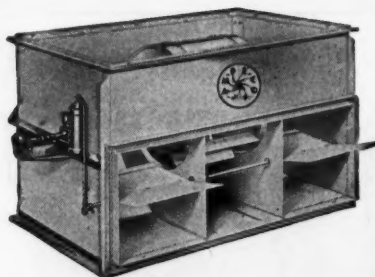
Write for details of the BRILLION furnaces and the new LECTROMELT process.

*Of course, the BIG BOY heavy duty  
BRILLION is LECTROMELT processed.*

**BRILLION FURNACE CO.**  
BRILLION, WISCONSIN

B

Say you saw it in AMERICAN ARTISAN—Thank you!



## Every Livewire Dealer Needs This Blower

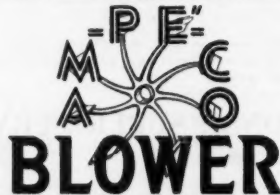
—for added profits in  
forced air circulation!

NOW you can guarantee positive and uniform heat circulation in every room in the house. Am-pe-co, the improved Rotary Blower has exclusive features that insure fully balanced air distribution to both inlets—vitaly essential to perfect blower operation. Furnacestat or thermostat control; quiet; non-leaking ring oil bearings; low operating cost. Am-pe-co meets the need for a really efficient blower that will net the dealer a good profit.

Built with or without automatic dampers which open when blowers stop, for gravity circulation. Get a bigger share of this forced air business, and make more money. Send today for complete detailed literature.

**AMERICAN MACHINE PRODUCTS COMPANY**  
Marshalltown, Iowa

For 15 Years Manufacturers of Precision Products



## The Agency for the

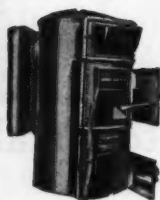
# GILTEDGE FURNACE

has always been a profit maker  
for the dealer

Write for agency details today

**SCHWAB FURNACE & MFG. CO.**  
283 Clinton Street Milwaukee, Wis.

## WESTERN



Here is a furnace  
you'll be proud to sell.  
Strong, sturdy, reliable; it will so please  
your customers that  
they will ask your advice  
in their other purchasing problems.

**WESTERN STEEL PRODUCTS CO.**  
130 Commonwealth Ave., Duluth, Minn.



# Oh WHAT A LINE

AKRON  
AIR BLAST

ATH-A-NOR

SOLID COMFORT & NEWARK STEEL

THE FURNACE LINE  
OF MANY FEATURES

OVER **50** YEARS

*of Practical Experience in Warm  
Air Furnace Engineering and  
Manufacture*

Way back when the stove and fireplace were important, we were making our first experiment in the construction and designing of warm air furnaces. Over a period of 50 years the same method of experimenting and testing has formed the background and foundation of the May-Fiebeger line.

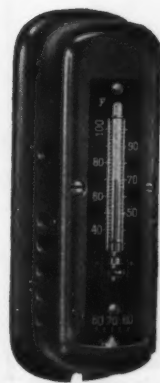
## A FURNACE FOR EVERY NEED—STEEL OR CAST

If you are a progressive warm air heating installer we are certain that you will be interested in the May-Fiebeger franchise. The completeness of the line, superior construction, and the May-Fiebeger cooperation will assist you in gaining better profits for your time and labor.

**The MAY-FIEBEGER COMPANY**  
NEWARK, OHIO

Have you seen or heard about our complete Automatically Controlled Air Conditioning Unit? If not, let us send you this information.

# 115 Leading Jobbers Now Carry



**A**NNOUNCED only a few months ago, 115 leading jobbers throughout the country already are carrying the H & C Automatic Heat Control.

Could anything more clearly indicate the wonderful salability of this product? Fully automatic, electric motor driven, trouble-proof, priced way below anything at all comparable, the H & C Automatic Heat Control offers a real opportunity for quick sales and generous profits. Get your share of this business. Fill in and mail the coupon at once.

LIST PRICE

**\$45<sup>00</sup>**

Including Every  
Necessary Fitting  
and Ball Bearing  
Pulleys!

**Hart & Cooley Mfg. Co.**

*General Sales Office*

61 West Kinzie St. Chicago, Ill.



HART & COOLEY MFG. CO., 61 W. Kinzie St., Chicago.

☐ Please send me, at your regular dealer price of \$27.00, one H & C Automatic Heat Control through the following jobber:

☐ Advise nearest jobber carrying the line.

☐ Send descriptive literature.

Firm Name.....

St. Address.....City.....

State.....Signed.....

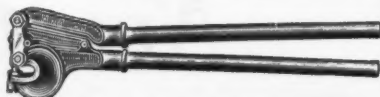
American Artisan, Feb. 16, 1931

Mention AMERICAN ARTISAN in your reply—Thank you!

**CUT LABOR COSTS****USE****WHITNEY Lever PUNCHES.**

Punches which have stood the gaff since 1908—punches which are recommended by over fifty thousand workers in metal all over the world.

**No. 1  
Heavy Duty  
Punch**



Here's a punch for tough work—weighs 22 pounds, correctly balanced—capacity  $\frac{3}{8}$ " holes through  $\frac{1}{4}$ " iron. Heavily reinforced for strains. Punches and dies from  $\frac{1}{8}$ " to  $9/16$ " x  $1/64$ ". Insertable pipe handles.

**No. 2 Punch**

**The Leader for Over 20 Years**

This is the punch that made the WHITNEY line famous. Length 23"—weight 13 lbs.—depth of throat  $1-11/16$ "—capacity  $5/16$ " through  $\frac{1}{4}$ " iron or equivalent. Extra punches and dies  $3/32$ " to  $\frac{1}{2}$ " x  $1/64$ ".



There is a  
WHITNEY to  
fit every job.  
Write for com-  
plete catalogue

**W. A. WHITNEY MFG. CO.**

636 Race Street

Rockford, Ill.

Order from  
Your Jobber



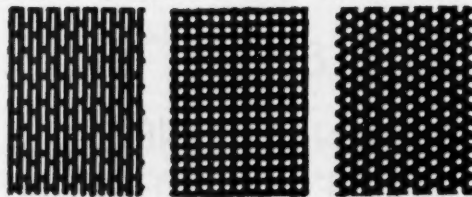
Look for This  
Trade Mark

TRADE MARK REGISTERED

**Our Line**  
Light and heavy  
machinery for  
all classes of  
sheet metal,  
plate and  
structural  
work.

**SQUARING SHEAR**  
Capacity 10" x 10" sheet metal

**BERTSCH & CO.**  
Cambridge City Indiana

**PERFORATED METALS**

All Sizes and Shapes of Holes  
In Steel, Zinc, Brass, Copper, Tinplate, etc.  
For All Screening, Ventilating and Draining  
EVERYTHING IN PERFORATING METAL

**THE HARRINGTON & KING PERFORATING CO.**

5649 FILLMORE ST.—CHICAGO, ILL. U. S. A.  
NEW YORK OFFICE: 114 LIBERTY ST.

**RYERSON****IMMEDIATE SHIPMENT FROM STOCK**

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

Write for Journal and Stock List

**JOSEPH T. RYERSON & SON INC.**

Chicago  
Detroit

Milwaukee  
St. Louis

Jersey City  
Cincinnati

Buffalo  
Cleveland

Philadelphia  
Boston

**SHEETS****CHICAGO STEEL SLITTING SHEAR****LIGHT—POWERFUL  
DURABLE**

Capacity 10 gauge sheets  
Any Length or Width  
Flat Bars  $3/16$  x 2"  
Weight 22 pounds

**Price \$15.00 Net**

F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel. Most indispensable high grade shears made. Equal to other shears selling at over twice the price. **ORDER YOURS TODAY.**

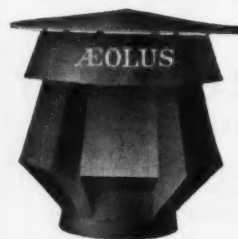
**DREIS & KRUMP MFG. CO., 7404 Loomis St., Chicago**

**Miters**  
Demand  
"Champion" Miters  
and Fittings  
from your  
Jobber!

**Braden**  
MANUFACTURING  
COMPANY  
TERRE HAUTE  
INDIANA

**Champion**  
PRODUCTS

**Install** **ÆOLUS**  
Improved  
**VENTILATORS**



FOR industrial buildings,  
schools, homes, theaters, etc.  
Made in 14 different metals.  
Constant ventilation—no noise  
—no upkeep.

**ÆOLUS DICKINSON**

Industrial Division of Paul Dickinson,  
Inc.

3332-52 South Artesian Avenue  
Chicago, Ill.

Say you saw it in AMERICAN ARTISAN—Thank you!

A Good Furnace Made Better . . . . .  
 A Price That Defies Competition . . . . .  
*that's the---*

# RYBOLT FURNACE

**D**URING the past quarter century the RYBOLT has won an enviable reputation for utmost reliability—a factor that has led to thousands and thousands of satisfactory installations.

Now . . . with the addition of important improvements; a one-piece radiator, of uniform thickness, with smoke and cleanout collars cast on; a competitive price, made possible only by RYBOLT'S quantity production and modern manufacturing methods . . . the New 1931 RYBOLT offers unequalled opportunities to dealers desiring to increase sales by giving prospects their "money's worth."

If you haven't already asked for details of our interesting proposition, write now—no obligation.



## THE RYBOLT HEATER COMPANY

Ashland, Ohio

Cincinnati

Indianapolis

### A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

*Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.*

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

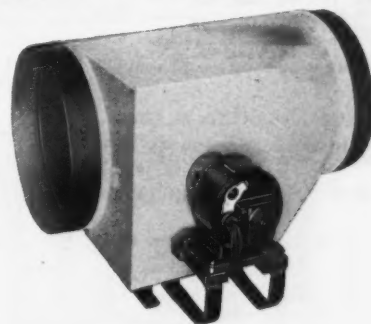
Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. **CLIP AND SEND THIS AD IN NOW!**

#### AMERICAN FOUNDRY & FURNACE COMPANY

Bloomington,

*World's largest manufacturers  
of blower furnace systems*

Illinois



## MIDLAND

**Offers—** Quick service on five complete lines of riveted gas tight steel furnaces—El Capitan—El Dorado—Truesteel—Ben Franklin—also the complete line of Success Heaters.

A complete advertising and merchandising service that will fit your business.

An engineering service that is practical and always at the command of Midland Dealers.

A desirable and convenient time payment plan that is bound to increase your sales.

### MIDLAND FURNACE CO.

COLUMBUS, OHIO and DES MOINES, IOWA

*"Yours for  
Cleaner Heat"*

Mention AMERICAN ARTISAN in your reply—Thank you!



# ~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

## METALS

### PIG IRON

Chicago Fdy., No. 2	\$17.50
Southern Fdy. No. 2	\$17.01 to 17.51
Lake Superior Charcoal	27.04
Malleable	17.50

### FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC 20x28 112 sheets	\$22.50
IX 20x28	25.50
IXX 20x28 56 sheets	14.50
IXXX 20x28	15.50
XXXX 20x28	17.00

### TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	\$24.00
IX 20x28, 40-lb. 112 sheets	26.50
IC 20x28, 25-lb. 112 sheets	20.50
IX 20x28, 25-lb. 112 sheets	23.50
IC 20x28, 20-lb. 112 sheets	19.00
V 20x28, 20-lb. 112 sheets	22.00

### "ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	\$4.15
5/16 in.—100 lbs.	4.05
1/2 in.—100 lbs.	3.85

### COKE PLATES

Cokes, 80 lbs., base, 20x28	\$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC	12.75
Cokes, 135 lbs., base, IX	14.75
Cokes, 155 lbs., base, 2X	8.50
Cokes, 175 lbs., base, 3X	9.35
Cokes, 195 lbs., base, 4X	10.25
56 sheets	

### BLUE ANNEALED SHEETS

Base 10 ga.—per 100 lbs.	\$3.35
"Armco" 10 ga.—per 100 lbs.	4.15

### ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs. \$3.75
No. 22	per 100 lbs. 3.70
No. 24	per 100 lbs. 3.75
No. 26	per 100 lbs. 3.85
No. 27	per 100 lbs. 3.90
N 28	per 100 lbs. 4.00

### GALVANIZED

No. 16	per 100 lbs. \$3.85
No. 18	per 100 lbs. 3.95
No. 20	per 100 lbs. 4.15
No. 22	per 100 lbs. 4.20
(Standard differentials on extras to apply)	
No. 24	per 100 lbs. \$4.35
No. 26	per 100 lbs. 4.60
No. 27	per 100 lbs. 4.70
No. 28	per 100 lbs. 4.85
"Armco" 24	per 100 lbs. 5.95

### BAR SOLDER

Warranted 50-50	per 100 lbs. \$18.00
45-55	per 100 lbs. 17.00
48-52	per 100 lbs. 17.75
Plumbers'	per 100 lbs. 15.50

### ZINC

In Slabs	\$5.00
----------	--------

### SHEET ZINC

Cash Lots (600 lbs.)	\$12.00
Sheet Lots (100 lbs.)	13.00

### BRASS

Sheets, Chicago base	17 1/4 c
Tubing, brazed, Chicago base	24 1/4 c
Tubing, seamless, Chicago base	22 c
Wire, Chicago base	17 1/4 c
Rods, Chicago base	15 1/4 c

## COPPER

Sheets, Chicago base	19 1/4 c
Tubing, seamless, Chicago base	22 1/4 c
Wire, plain rd., 8 B. & S. Ga. and heavier	12 1/4 c

## LEAD

American Pig	\$6.00
Bar	7.50

## TIN

Bar Tin	per 100 lbs. \$32.00
Pig Tin	per 100 lbs. 31.00

## SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

## ASBESTOS

Paper up to 1/16	5c per lb.
Roll board	5 1/2 c per lb.
Mill board 3/32 to 1/2	5 1/2 c per lb.
Corrugated paper (250 sq. ft. per roll)	\$4.00 per roll

## ASBESTOS SEGMENTS

8 in.	per 25 sets \$1.85
9 in.	per 25 sets 2.10
10 in.	per 25 sets 2.35
12 in.	per 25 sets 2.65

## CEMENT FURNACE

5-lb. cans, net	\$0.40
10-lb. cans, net	0.80
25-lb. cans, net	2.00
Per 100 lbs.	7.50

## CLIPS

Damper	
No-Rivet Steel, with tail pieces, per gross	\$9.50
Rivet Steel, with tail pieces, per gross	7.50
Tail pieces, per gross	2.40

## COPPER FOOTING

Copper Footing	41 %
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## CORNICE BRAKES

Chicago Steel Bending	
Nos. 1 to 4B	Not

## CUT-OFFS

Cal., plain, round or cor. rd.	
26 gauge	30 %
28 gauge	35 %

## DAMPERS

Yankee Warm Air	
7 inch, doz.	\$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

## EAVES TROUGH

Galv. Crimpedge, crated	75-15 %
Zinc	60 %

## ELBOWS

Conductor Pipe	
Galv. plain or corrugated, round flat crimp.	
28 gauge	60-10 %
26 gauge	50 %
24 gauge	15 %
Galv. Terne Steel	
Plain Rd. and Rd. Corr.	
28 gauge	60-10 %
26 gauge	50 %
24 gauge	15 %

## Square Corrugated

28 gauge	55 %
26 gauge	40 %

## Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.	
Not nested	70 & 5 %
Nested solid	70 & 5 %

## Sq. Corr., A. & B. & Octagon

28 gauge	55 %
26 gauge	40 %

## Portico

1. 1 1/4, 1 1/2 inch	45 %
----------------------	------

## Copper

16 oz. all designs	50 %
--------------------	------

## Zinc

All styles	60 %
------------	------

## ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue	
No. 28 Gauge.	Doz.
5 inch	\$1.15
6 inch	1.25
7 inch	1.75

## Adjustable—Uniform Blue

No. 28 Gauge, Uniform Blue.	
5 inch	\$1.60
6 inch	1.75
7 inch	2.10

## WOOD FACES—60 % off list.

## FIRE POTS

No. 02 Gasoline Torch, 1 qt.	\$3.13
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

## GLASS

Single and Double Strength, A, all brackets	85 %
Single and Double Strength, B, all brackets	87 %

## HANGERS

Conductor Pipe	
Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

## Eaves Trough

Steel (galv. after forming) from list	45 %
Selflock E. T. Wire, List	10 %

## HOOKS

Conductor	
"Direct Drive" Wrought Iron for wood or brick	15 %

## MITRES

Galvanized Steel Mitres	
28 gauge	70
26 gauge	60-20

## PASTE

### Asbestos Dry Paste

200-lb. barrel	\$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

## PIPE

### Galvanized

Crated and nested (all gauges)	75-12 1/2 %
Crated and not nested (all gauges)	75-7 1/2 %

### Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

## Lead

Per 100 lbs.	\$12.50
Stove Pipe "Milcor" "Titelock" Uniform Blue	
28 gauge, 5 inch U. C. nested	\$10.00
28 gauge, 6 inch U. C. nested	11.00
28 gauge, 7 inch U. C. nested	13.00
30 gauge, 5 inch U. C. nested	9.25
30 gauge, 6 inch U. C. nested	10.00
30 gauge, 7 inch U. C. nested	12.00

### T-Joint Made Up

6 inch, 28 ga.	per doz. \$3.40
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## REGISTERS AND FACES

### Floor Registers

Steel and Semi-Steel	40 & 10 %
All Cast Iron	20 %

### Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

### Adjustable Ventilators

Adjustable Ventilators	40 & 10 %
------------------------	-----------

## COLD AIR FACES

Steel and Cast, less than 14" width	40 & 10 %
Steel, 14" and wider	65 & 10 %
Cast, 14" and wider	60 & 10 %
Special Cold Air Faces, Steel or Cast	40 & 10 %

## RIDGE ROLL

Galv. Plain Ridge Roll, b'd'd	75-15-5 %
Galv., Plain Ridge Roll, crated	75-15 %

## SCREWS

Sheet Metal	
7. 1/2 x 1/4, per gross	\$0.52
No. 10, 1/2 x 1/4, per gross	0.53
No. 14, 1/2 x 1/4, per gross	0.53

## SHEARS, TINNERS' AND MACHINISTS'

Viking	\$22.00
--------	---------

### Lennox Throatless

No. 18	35 %
Shear blades	10 %
(f. o. b. Marshalltown, Iowa.)	

## SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	50 %
26 gauge, round flat crimp	50 %
24 gauge, round flat crimp	15 %

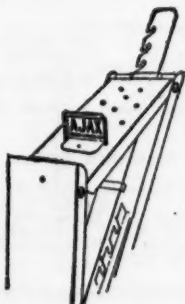
## SNIPS

Tinners'	Not
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## VENTILATORS

Standard	30 to 40 %
Milcor	Not

**YES SIR  
Spring  
Will Soon Be  
Back!**



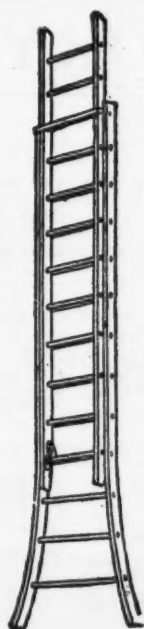
No. 2 "Ajax"  
Roof Bracket

**How About  
Your Ladder  
and Ladder  
Jack?**



Safety  
Ladder Jack

**How About  
Brackets,  
Paints and  
Felts?**



Western Style  
Extension Ladder

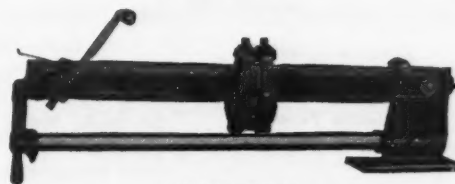
**How About  
Cements—As  
Ice of Winter  
Melts?**

THE J. M. & L. A.  
**OSBORNE**  
Manufacturers - Distributors  
DETROIT - CLEVELAND - BUFFALO  
"Everything Used in Sheet Metal Work"

## The Choice of the Expert . . .

High grade materials, good workmanship, advanced construction, low initial cost, and a record small up-keep sum up what the PEXTO trade mark on a sheet metal working machine implies.

**Turning—Wiring—Burring—Beading  
Machines.**



GROOVERS



CRIMPER



SQUARING SHEARS

*For Information Consult Your Service Dealer*

*Send for Catalog No. 25A*



**THE PECK, STOW & WILCOX CO.**  
Southington, Conn.

TRADE  
**BB**  
MARK

**"SHUR-LOCK" CONDUCTOR PIPE  
"E-Z FIT" EAVES TROUGH  
EAVES TROUGH HANGERS  
"QUAKER CITY" MITERS  
END PIECES, CAPS  
AND OUTLETS**

**PIPE HOOKS**

**PIPE FASTENERS**

**CONDUCTOR HEADS**

**ORNAMENTAL CONDUCTOR  
STRAPS AND ENDS**

*Look for B. B. on Every Piece—it is a  
Mark of Quality*

**SOLD BY LEADING JOBBERS  
EVERYWHERE**

**BERGER BROS. CO.**

229 to 237 Arch St. Philadelphia, Pa.

*Western Office: 140 So. Dearborn St., Chicago*

*Mention AMERICAN ARTISAN in your reply—Thank you!*

# BUYERS' DIRECTORY

## Air Cleaners

American Fdy. & Furnace Co.,  
Bloomington, Ill.  
Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens, Point, Wis.  
Meyer & Bro. Co., F.,  
Peoria, Ill.  
Watt Mfg. Co.,  
Sterling, Ill.

## Air Washers

A. Gehrl & Co.,  
Tacoma, Wash.  
Watt Mfg. Co.,  
Sterling, Ill.

## Aluminum Sheets

J. M. & L. A. Osborn Co.,  
Cleveland, Ohio

## Asbestos—Liquid

Technical Products Co., Pittsburgh, Pa.

## Asbestos Paper

Wilson, Grant, Inc.,  
Chicago, Ill.

## Blast Gates

Berger Bros. Co.,  
Philadelphia, Pa.

## Blowers—Furnace

American Fdy. & Furnace Co.,  
Bloomington, Ill.  
American Machine Products Co.,  
Marshalltown, Iowa  
A. Gehrl & Co.,  
Tacoma, Wash.  
Brundage Co.,  
Kalamazoo, Mich.  
Lakeside Co.,  
Hermansville, Mich.  
Watt Mfg. Co.,  
Sterling, Ill.

## Bolts—Stove

Lamson & Sessions Co.,  
Cleveland, Ohio  
Ryerson & Son, Inc.,  
Chicago, N. Y., St. L., Det., Cleve.

## Brakes—Bending

Dreis & Krump Mfg. Co.,  
Chicago, Ill.  
Interstate Machinery Co.,  
Chicago, Ill.  
Ryerson & Son, Inc.,  
Chicago, N. Y., St. L., Det., Cleve.  
Peck, Stow & Wilcox Co.,  
Southampton, Conn.

## Brakes—Corners

Dreis & Krump Mfg. Co.,  
Chicago, Ill.

## Brass and Copper

American Brass Co.,  
Waterbury, Conn.  
Copper & Brass Research Association,  
New York, N. Y.

## Cans—Garbage

Diener Mfg. Co., G. W.,  
Chicago, Ill.  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio

## Castings—Malleable

Fanner Mfg. Co.,  
Cleveland, Ohio

## Ceilings—Metal

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Chaplets

Fanner Mfg. Co.,  
Cleveland, Ohio

## Cleaners—Vacuum

Brillion Furnace Co.,  
Brillion, Wis.  
National Super Service Co.,  
Toledo, Ohio

## Copper

American Brass Co.,  
Waterbury, Conn.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Cornices

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Cut-offs—Rain Water

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Dampers—Quadrants—Accessories

Aeolus Dickinson,  
Chicago, Ill.  
Hart & Cooley Co.,  
Holland, Mich.  
Howes Co., S. M.,  
Boston, Mass.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Parker-Kalon Corp.,  
New York, N. Y.

## Dampproofings

Lastik Products Corp.,  
Pittsburgh, Pa.

## Damper Regulators

Sheer Co., H. M.,  
Quincy, Ill.

## Diffuser—Air Duct

Aeolus Dickinson,  
Chicago, Ill.

## Drills—Electric

Ryerson & Son, Inc.,  
Chicago, N. Y., St. L., Det., Cleve.  
J. M. & L. A. Osborn Co.,  
Cleveland, Ohio  
The Stanley Electric Tool Co.,  
New Britain, Conn.

Drive Screws—Hardened Metallic  
Parker-Kalon Corp.,  
190 Varick St., New York

## Eaves Trough

Barnes Metal Products Co.,  
Chicago, Ill.  
Berger Bros. Co.,  
Philadelphia, Pa.  
Chase Brass & Copper Co.,  
Waterbury, Conn.  
Chicago Metal Mfg. Co.,  
Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Elbows and Shoes—Conductor

Apex Gutter Hanger Corp.,  
New York, N. Y.  
Barnes Metal Products Co.,  
Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Rockford Sheet Steel Co.,  
Rockford, Ill.

## Filters—Furnace

Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens Point, Wis.

## Fittings—Conductor

Barnes Metal Products Co.,  
Chicago, Ill.  
Braden Mfg. Co.,  
Terre Haute, Ind.  
Chicago Metal Mfg. Co.,  
Chicago, Ill.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Chicago Metal Mfg. Co.,  
Chicago, Ill.

## Fluxes—Soldering

Kester Soldering Co.,  
Chicago, Ill.

## Furnace Cement

Connors Paint Mfg. Co.,  
Wm., Troy, N. Y.  
Lastik Products Corp.,  
Pittsburgh, Pa.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.  
Technical Products Co.,  
Pittsburgh, Pa.

## Furnace Chain

Hart & Cooley Co.,  
Holland, Mich.

## Furnace Cleaners—Suction

Brillion Furnace Co.,  
Brillion, Wis.  
National Super Service Co.,  
Toledo, Ohio

## Furnace Fans

A-C Mfg. Co.,  
Pontiac, Ill.  
American Fdy. & Furnace Co.,  
Bloomington, Ill.  
Brundage Co.,  
The Kalamazoo, Mich.  
Lakeside Co.,  
Hermansville, Mich.  
Robinson Co., A. H.,  
Massillon, Ohio  
Watt Mfg. Co.,  
Sterling, Ill.

## Furnace Filters

Independent Air Filter Co.,  
Chicago, Ill.  
Kleenaire Filter Co.,  
Stevens, Point, Wis.

## Furnace Pokers

Fanner Mfg. Co.,  
Cleveland, Ohio

## Furnace Pulleys

Hart & Cooley Co.,  
Holland, Mich.

## Furnace Regulators

Minneapolis-Honeywell Regulator  
Co.,  
Minneapolis, Minn.  
Noll Regulator Co.,  
Youngstown, Ohio  
Sheer Co., H. M.,  
Quincy, Ill.  
White Mfg. Co.,  
Minneapolis, Minn.

## Furnace Rings

Forest City-Walworth Run  
Foundries Co.,  
Cleveland, Ohio

## Furnaces—Gas

Calkins & Pearce,  
Columbus, Ohio  
Lennox Furnace Co.,  
Marshalltown, Iowa  
Robinson Co., A. H.,  
Massillon, Ohio  
Rudy Furnace Co.,  
Dowagiac, Mich.  
Wise Furnace Co.,  
Akron, Ohio

## Furnaces—Oil Burning

Motor Wheel Corp.,  
Heater Div.,  
Lansing, Mich.

## Furnaces—Warm Air

Agricola Furnace Co.,  
Gadsden, Ala.  
American Fdy. & Furnace Co.,  
Bloomington, Ill.  
American Furnace Co.,  
St. Louis, Mo.  
The Beckwith Co.,  
Dowagiac, Mich.  
Brillion Furnace Co.,  
Brillion, Wis.  
Deshler Foundry & Machine Works,  
Deshler, Ohio  
Enterprise Boiler & Tank Works,  
Chicago, Ill.  
Forest City-Walworth Run Fdy.,  
Cleveland, Ohio  
Fox Furnace Co.,  
Elyria, Ohio  
Henry Furnace & Fdy. Co.,  
Cleveland, Ohio  
London Furnace Co.,  
London, Ohio  
Lennox Furnace Co.,  
Marshalltown, Iowa  
Syracuse, N. Y.  
May Flebeger Furnace Co.,  
Newark, Ohio  
Meyer Furnace Co.,  
The Peoria, Ill.  
Midland Furnace Co.,  
Columbus, Ohio  
Motor Wheel Corp.,  
Heater Div.,  
Lansing, Mich.  
Mt. Vernon Furnace & Mfg. Co.,  
Mt. Vernon, Ill.  
Peerless Foundry Co.,  
Indianapolis, Ind.  
Premier Warm Air Heater Co.,  
Dowagiac, Mich.  
Rybolt Heater Co.,  
Ashland, Ohio  
Rudy Furnace Co.,  
Dowagiac, Mich.  
Schwab Furnace & Mfg. Co.,  
Milwaukee, Wis.  
Standard Fdy. & Furnace Co.,  
De Kalb, Ill.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.  
Western Steel Products Co.,  
Duluth, Minn.  
Wise Furnace Co.,  
Akron, Ohio

## Gas Burning Attachments

Calkins & Pearce,  
Columbus, Ohio

## Grilles

Auer Register Co.,  
Cleveland, Ohio  
Harrington & King Perforating Co.,  
Chicago, Ill.  
Hart & Cooley Co.,  
New Britain, Conn.  
Independent Register & Mfg. Co.,  
Cleveland  
Tuttle & Bailey Mfg. Co.,  
Chicago, Ill.  
U. S. Register Co.,  
Battle Creek, Mich.

## Guards—Machine and Belt

Harrington & King Perforating Co.,  
Chicago, Ill.

## Handles—Boiler

Berger Bros. Co.,  
Philadelphia, Pa.

## Handles—Soldering Iron

Hyo Mfg. Co.,  
New York, N. Y.

## Handles—Furnace Door

Fanner Mfg. Co.,  
Cleveland, Ohio

## Hangers—Eaves Trough

Apex Gutter Hanger Corp.,  
New York, N. Y.  
Berger Bros. Co.,  
Philadelphia, Pa.  
Chase Brass & Copper Co.,  
Waterbury, Conn.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Heat Regulation Systems

Minneapolis-Honeywell Regulator  
Co.,  
Minneapolis, Minn.  
Noll Regulator Co.,  
Youngstown, Ohio  
Sheer Co., H. M.,  
Quincy, Ill.  
White Mfg. Co.,  
Minneapolis, Minn.

## Heaters—Cabinet

Fox Furnace Co.,  
Elyria, Ohio  
Mt. Vernon Furnace & Mfg. Co.,  
Mt. Vernon, Ill.  
Motor Wheel Corp.,  
Heater Division,  
Lansing, Mich.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.

## Heaters—School Room

Meyer Furnace Co.,  
The Peoria, Ill.  
Western Steel Products Co.,  
Duluth, Minn.  
Waterman-Waterbury Co.,  
Minneapolis, Minn.

## Humidifiers

Automatic Humidifier Co.,  
Oscar Falls, Iowa  
Diener Mfg. Co., G. W.,  
Chicago, Ill.  
Meyer & Bro. Co., F.,  
Peoria, Ill.  
Sheer Co., H. M.,  
Quincy, Ill.  
Sallada Mfg. Co.,  
Minneapolis, Minn.

## Lath—Expanding Metal

Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Machines—Crimping

Bertsch & Co.,  
Cambridge City, Ind.  
Yoder Co.,  
The Cleveland, O.

## Machinery—Culvert

Bertsch & Co.,  
Cambridge City, Ind.  
Interstate Machinery Co.,  
Chicago, Ill.

## Machinery—Rebuilt

Interstate Machinery Co.,  
Chicago

## Machines—Tinsmith's

Bertsch & Co.,  
Cambridge City, Ind.  
Dreis & Krump Mfg. Co.,  
Chicago, Ill.  
Hyo Mfg. Co.,  
New York, N. Y.  
Interstate Machinery Co.,  
Chicago, Ill.  
Marshalltown Mfg. Co.,  
Marshalltown, Iowa  
Osborn Co.,  
The J. M. & L. A.,  
Cleveland, Ohio  
Ryerson & Son, Inc.,  
Chicago, N. Y., St. L., Det., Cleve.  
The Stanley Electric Tool Co.,  
New Britain, Conn.  
Whitney Mfg. Co.,  
W. A.,  
Rockford, Ill.  
Yoder Co.,  
The Cleveland, O.

## Metals—Perforated

Harrington & King Perforating Co.,  
Chicago, Ill.

## Miters—Eaves Trough

Barnes Metal Products Co.,  
Chicago, Ill.  
Berger Bros. Co.,  
Philadelphia, Pa.  
Braden Mfg. Co.,  
Terre Haute, Ind.  
Milcor Steel Co.,  
Mil., Canton, Chgo., La Crosse, K. C.

## Nails—Copper and Brass

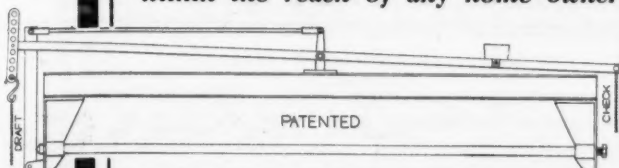
Chase Brass & Copper Co.,  
Waterbury, Conn.

(Continued on page 62)

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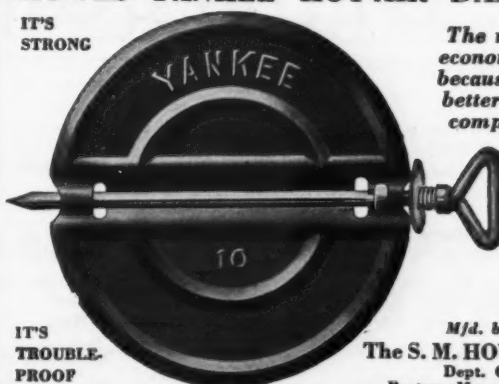
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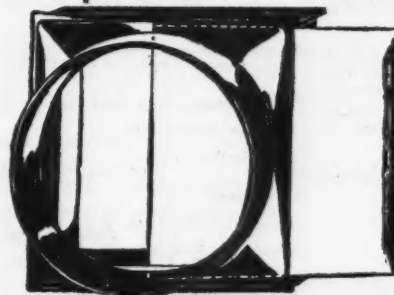
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CEDAR FALLS, IOWA

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# BUYERS' DIRECTORY

(Continued from page 60)

**Nails—Hardened Masonry**  
Parker-Kalon Corp., New York, N. Y.

**Oil Burners**  
Berryman System of Oil Heating, Inc., Chicago, Ill.  
Bettendorf Mfg. Co., Bettendorf, Iowa  
Rock Oil Burner Co., Madison, Wis.  
Melvaine Burner Corp., Evanston, Ill.  
Silent Automatic Corp., Detroit, Mich.

**Paint**  
Connors Paint Mfg. Co., Wm., Troy, N. Y.

**Patterns—Boat**  
Thompson Boat & Pattern Co., Decorah, Iowa

**Perforated Metals**  
Harrington & King Perforating Co., Chicago, Ill.

**Pipe and Fittings—Furnace**  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Peerless Foundry Co., Indianapolis, Ind.

**Pipe and Fittings—Stove**  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Pipe—Conductor**  
Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Pipe—Spiral**  
Chicago Metal Mfg. Co., Chicago, Ill.

**Punches**  
Bertsch & Co., Cambridge City, Ind.  
Hyro Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
W. A. Whitney Mfg. Co., Rockford, Ill.

**Punches—Combination Bench and Hand**  
Hyro Mfg. Co., New York, N. Y.

**Punches—Head**  
Hyro Mfg. Co., New York, N. Y.  
W. A. Whitney Mfg. Co., Rockford, Ill.

**Putty—Stove**  
Connors Paint Mfg. Co., Wm., Troy, N. Y.

**Radiator Cabinets**  
Hart & Cooley Co., Holland, Mich.

**Ranges—Gas**  
The Beckwith Co., Dowagiac, Mich.  
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

**Registers—Warm Air**  
Auer Register Co., Cleveland, Ohio  
Forest City-Walworth Run Foundries Co., Cleveland, Ohio  
General Products Corp., Indianapolis, Ind.  
Hart & Cooley Co., Holland, Mich.  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Independent Register & Mfg. Co., Cleveland, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Rock Island Register Co., Rock Island, Ill.  
Symonds Register Co., St. Louis, Mo.  
Tuttle & Bailey Mfg. Co., Chicago, Ill.  
United States Register Co., Battle Creek, Mich.

**Register Shields**  
General Products Corp., Indianapolis, Ind.

**Registers—Wood**  
American Wood Register Co., Plymouth, Ind.  
Auer Register Co., Cleveland, Ohio  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Regulators—Heat**  
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.  
H. M. Sheer Co., Chicago, Ill.  
White Mfg. Co., Minneapolis, Minn.

**Ridging**  
American Rolling Mill Co., Middletown, Ohio  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Rivets—Stove**  
Lamson & Sessions Co., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Rods—Stove**  
Lamson & Sessions Co., Cleveland, Ohio

**Rolls—Forming**  
Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.

**Roofing Cement**  
Connors Paint Mfg. Co., Wm., Troy, N. Y.  
Lastik Products Corp., Pittsburgh, Pa.

**Roof Paints**  
Lastik Products Corp., Pittsburgh, Pa.

**Roof—Flashing**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Roofing—Iron and Steel**  
American Rolling Mill Co., Middletown, Ohio  
Republie Steel Corp., Youngstown, Ohio  
Inland Steel Co., Chicago, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Roofing—Tin**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Taylor Co., N. & G., Philadelphia, Pa.

**Rubbish Burners**  
Hart & Cooley Co., Holland, Michigan

**Schools—Sheet Metal Pattern Drafting**  
St. Louis Technical Institute, St. Louis, Mo.

**Schools—Warm Air Heating**  
St. Louis Technical Institute, St. Louis, Mo.

**Screws—Hardened Metallic Drive**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Parker-Kalon Corp., 200 Varick St., New York

**Screws—Hardened Self-Tapping, Sheet Metal**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Parker-Kalon Corp., 200 Varick St., New York

**Screens—Perforated Metal**  
Harrington & King Perforating Co., Chicago, Ill.

**Scuppers**  
Aeolus Dickinson, Chicago, Ill.

**Shears—Hand and Power**  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Ia.  
Peck, Stow & Wilcox Co., Southington, Conn.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
The Stanley Electric Tool Co., New Britain, Conn.  
Viking Shear Co., Erie, Pa.  
Yoder Co., The, Cleveland, O.

**Sheet Metal Screws—Hardened, Self-Tapping**  
Parker-Kalon Corp., 200 Varick St., New York

**Sheets—Alloy**  
International Nickel Co., New York, N. Y.  
Republie Steel Corp., Youngstown, Ohio

**Sheets—Black and Galvanized**  
Inland Steel Co., Chicago, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Republie Steel Corp., Youngstown, Ohio  
Rockford Sheet Steel Co., Rockford, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
Taylor Co., N. & G., Philadelphia, Pa.

**Sheets—Iron**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Republie Steel Corp., Youngstown, Ohio  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
**Sheets—Tin**  
Taylor Co., N. & G., Philadelphia, Pa.

**Shingles and Tiles—Metal**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Sifters—Ash**  
Diener Mfg. Co., G. W., Chicago, Ill.

**Sky Lights**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Snips**  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Solder—Acid Core**  
Kester Solder Co., Chicago, Ill.

**Solder—Self-Fluxing**  
Kester Solder Co., Chicago, Ill.

**Solder—Rosin Core**  
Kester Solder Co., Chicago, Ill.

**Solder**  
Kester Solder Co., Chicago, Ill.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Soldering Furnaces**  
Diener Mfg. Co., G. W., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Specialties—Hardware**  
Diener Mfg. Co., G. W., Chicago, Ill.

**Stars—Hard Iron Cleaning**  
Fanner Mfg. Co., Cleveland, Ohio

**Tinplate**  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Taylor Co., N. & G., Philadelphia, Pa.

**Tools—TinSmith's**  
Bertsch & Co., Cambridge City, Ind.  
Dries & Krump Mfg. Co., Chicago, Ill.  
Hyro Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Peck, Stow & Wilcox Co., Southington, Conn.  
Rockford Sheet Steel Co., Rockford, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.  
The Stanley Electric Tool Co., New Britain, Conn.  
Viking Shear Co., Erie, Pa.  
Whitney Mfg. Co., W. A., Rockford, Ill.

**Torches**  
Diener Mfg. Co., G. W., Chicago, Ill.  
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

**Trade Extension**  
Copper & Brass Research Association  
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio

**Trimnings—Stove and Furnace**  
Fanner Mfg. Co., Cleveland, Ohio

**Vacuum Cleaner—Furnace**  
Brillion Furnace Co., Brillion, Wis.  
National Super Service Co., Toledo, Ohio

**Ventilators—Floor**  
Aeolus Dickinson, Chicago, Ill.

**Ventilators—Roof**  
Aeolus Dickinson, Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Paul R. Jordan & Co., Indianapolis, Ind.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

**Ventilators—Ceiling**  
Hart & Cooley Co., New Britain, Conn.  
Henry Furnace & Fdy. Co., Cleveland, Ohio

**Wood Faces—Warm Air**  
Auer Register Co., Cleveland, Ohio  
American Wood Register Co., Plymouth, Ind.  
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

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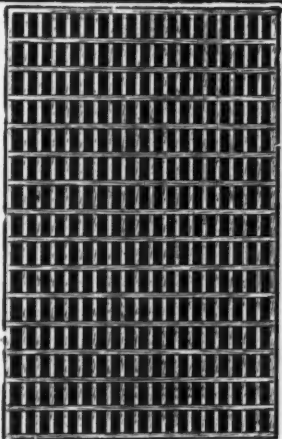
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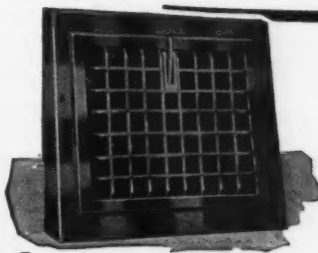
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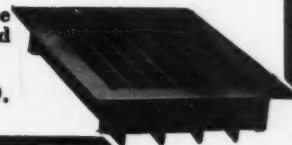


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Tell me all about the big Association Book Standard Practice in Sheet Metal Work.

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## ARE YOU USING LASTIK? WHY NOT?

It's an odorless, soft, pliable, smooth, easily worked, superior furnace cement—a cement which stays put. One test will prove its superiority to all other cements.

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# Classified Advertising

## BUSINESS CHANCES

Guaranteed Mailing Lists for the Furnace and Accessory Manufacturer and Jobber. For any state or all of them. H-533

**Terry Whalen & Associates**  
Bloomington, Ill. (Box 180)

For Sale—New business for shop or factory. Have new patentable steel gas furnace construction. Greater radiation, yet so simple, meets all competition. Would like to hear from firm who might be interested in manufacture and who could give employment to experienced sheet metal worker and furnace installer. Address R-531, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Good river bottom farm of 80 acres. \$6,000 worth of improvements. Will sell for \$10,000 or will exchange for stock of hardware or furniture up to \$6,000. Railroad within two miles. Good schools and churches near. Good roads. For information, write L. F. Sutterer, Perryville Hardware Company, Perryville, Missouri. Y-532

Wanted—Location for a heating and plumbing business, or would buy a small stock of hardware where shop could be run in connection, or an interest in a going business. Northwestern states, Washington or Oregon preferred. Address P. O. Box 473, Harvey, North Dakota. A-532

For Rent—A one story building; brick and concrete; floor space 98x54; suitable for small factory; has been shoe factory. Good shipping point at the Depot. Town of 700. Address J. J. Martin, Chamois, Missouri. B-533

For Sale or Exchange—My property, consisting of two stores, a room specially built for a tin shop, a three-car garage, and a seven-room flat—all modern. Address Emil Siepman, Culver, Indiana. M-531

For Sale—Plumbing and heating business. Full set of tools for each line. \$600.00 if taken in the next thirty thirty days. Address John L. Bloyd, Bement, Illinois. F-533

How to kill muriatic acid fumes, when used for soldering flux, we have used it for three years, and like it, especially for heavy soldering. Cheap and easy prepared. Formula, \$1.00 post paid. Address Floydada Tin Shop, 311 South Main Street, Floydada, Texas. G-533

New Soldering Fluid—Stainless, Odorless and cheap. Flows freely on all metals except aluminum and badly corroded galvanized iron. Formula, \$1.00. Squaring shear blades ground, \$1.50. Address P. C. Woods, 1002 East Main Street, Washington, Iowa. W-533

## HELP WANTED

Representative calling on the Warm Air Heating trade. Exclusive territory allotted. Commission basis. Address Star-Go Corporation, 2548 N. 18th Street, Milwaukee, Wis. S-533

Wanted—A tinner who is capable of taking full charge of a good shop and run it on a percentage basis. Must furnish good references. Prefer a man who might be interested in buying the shop later on. Address K-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

## HELP WANTED

Wanted—Heating Engineer to take complete charge of Heating Department. Must understand Domestic and Industrial forced-air heating. Address W-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted—Would like to hear from a good experienced tinner, plumbing and heating man who would like to get into business with little money. I have a good shop in a Minnesota town of 3,000, no competition. Have too much work and wish to get a good working partner. Address O-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

## Manufacturers' Agents

Wanted to sell our furnace cement, roofing paint and cement and calking compounds. Our consistent trade paper advertising is creating demand. Exclusive territory given with liberal commission. Address B-530, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Illinois.

Wanted—A good steady combination plumber and sheet metal worker. Must be strictly sober and furnish references. Address M-533, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

## SITUATION WANTED

### ENGINEER

23 years experience in warm air heating. Worked up in 13 years from installer's helper through shop, office, estimating, drafting, trouble-shooting to retail sales and management. Past 10 years, engineering work with supervision of retail and wholesale sales. Age 43, married, good health, good habits. Sixteen years with present firm. Member A.S.H.V.E., associate member A.S.M.E. Will consider position with reputable manufacturer of fans or furnaces, or with progressive heating contractor specializing in high grade gravity and fan heating.

Address P-533, AMERICAN ARTISAN  
139 North Clark Street Chicago, Ill.

Situation Wanted—First class sheet metal worker. Experienced in general sheet metal work, blowpipe, skylight, furnace and ventilation. Would like to connect with some reliable concern either with or without hardware. At the end of one year if satisfactory, I would like to buy an interest or the entire business. Prefer northwestern Iowa or southern Minnesota, in town of about 10,000 to 15,000. Married, sober and reliable. Address J-531, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Reliable experienced heating man and salesman, twenty years experience, wants connection with furnace manufacturers, cast or steel furnaces. Work with dealers on sales and layouts for modern installation with or without modern equipment. Address X-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—First class licensed plumber, sheet metal worker and heating man, steady, sober, and competent in all branches of the trade, would like steady position; or will take shop on commission. Address Arthur Greeter, Lake Geneva, Wisconsin. Z-532

## SITUATION WANTED

Situation Wanted—Twenty years experience in estimating, layout, selling and installing forced air heating and ventilating systems, and all kinds of roofing and sheet metal work. Can fill any position. Want connection with reliable company, preferable in Texas or West. Best of references furnished. Address H-531, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Are you in need of a man who is thoroughly experienced in all lines of the sheet metal trade, making a specialty of warm air heating? Can estimate the work, lay out the plans, and make blueprints. Have had sales experience, and will look out for your interests. A good reliable worker. Address H-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By man thirty-five years old. Ten years experience in selling and laying out all types of warm air heating plants. Thoroughly understands forced air heating. Do own layout and drafting. Have a successful selling record. Wish position as salesman with manufacturer or jobber. Will go anywhere. References furnished. Address S-532, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

Situation Wanted—Sheet Metal Worker and furnace man wants a steady position. Thirty-nine years old, married, steady and sober. Can read blueprints, knows the standard code, can lay out any pattern. Have had blow-pipe and large heating experience. Willing to clerk. Can estimate if necessary. Address K-531, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By man 54 years of age. Would prefer traveling position in Ohio although would be glad to entertain any offer in the furnace line. At the tin or sheet metal business practically all my life. Know, or have called on personally, around 150-200 furnace dealers in Ohio. Best of references furnished. Address W. D. Clemens, 622 Patterson Ave., Canton, Ohio. F-532

Situation Wanted—Would like to hear from some hardware firm who is in need of a good hardware clerk and salesman on or before April 1st. Job to be steady the year round. Twenty years of experience. Steady and reliable. Wisconsin preferred. Address O-531, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Have had six years experience as an executive in warm air furnace manufacturing. Can handle credits, collections, sales correspondence and purchasing of materials; also familiar with registers, fittings, and filling orders for repair parts. References on request. Address C-532, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By man thirty-five years of age, single, ten years experience in hot water, steam and warm air heating. Also sales managing and handling canvassers. Position wanted as salesman for a reliable furnace manufacturer or salesman and engineer for dealer. Address Geo. A. Whiteman, P. O. Box 112, Rochester, N. Y. G-531

Situation Wanted—By licensed plumber, sheet metal worker, and heating man. Married, thoroughly competent, sober and steady. Can take full charge of shop if desired. Wish steady employment. Address M. R. Trisler, 507 North East Street, Kewanee, Illinois. L-533

Situation Wanted—By all round sheet metal worker. Experienced in all branches of warm air heating work. Use the Standard Code. Would like steady position or will work on commission. Will go anywhere. Address E. M. True, R. No. 3, Box 810, Portland, Oregon. J-533

Say you saw it in AMERICAN ARTISAN—Thank you!



**SITUATION WANTED**

Situation Wanted—By a first class sheet metal worker and furnace man. Good reliable man, steady and sober. Please state wages. Address T-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—As salesmen and heating engineer. 15 years experience. Can do all drafting and estimating. Sober, hard worker. Can give best of references. Let's get together. Address T-533, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

**SITUATION WANTED**

Situation Wanted—By an all round man in tinning, plumbing and furnace work. Would like to locate in Wisconsin or Iowa. Can come at once. Address E-533, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

**TOOLS AND MACHINES**

For Sale—Tinner's tools. Cheap. For list and prices write B. P. Friebe, Manchester, W-531

**TOOLS AND MACHINES**

For Sale—Two Stove Pipe Folders; one tin folder; one large buring machine; one small buring machine; one large thick edge; one small thick edge; two 30" square shears; roofing tongs; roofing double seamers; 30" rollers; three double seamers and other machines all in good working condition. Address P. W. Nicola, Leavenworth, Kansas. C-533

For Sale—Complete line of tinner's tools, including electric motors and drill press. For information call Beverly 6710, Chicago, or write Mend-All Repair & Manufacturing Company, 921 West 87th Street, Chicago, Illinois. D-533

Wanted—The Peck, Stow & Wilcox Company No. 1734 improved foot gang punch, or its equal in some other make. Quote full particulars and best price in first letter. Address L-532, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

Wanted—A four or six foot box and pan brake, 16 gauge cap. Also 30" or 36" squaring shears. Address The Main Hardware & Supply Company, Painesville, Ohio. P-532

Wanted—A set of second hand tinner's tools and machines. Must be in good condition and cheap for cash. Address Roy K. Davis, 722 West Second Street, Xenia, Ohio. L-531

Wanted—A 10 foot brake for light iron. Address 20th Avenue Sheet Metal Works, 2141-43 Court Place, Denver, Colorado. J-532

Wanted—A Double Seaming Machine for seaming bottoms. Kindly specify name, number and price in your first letter. Address Huettmann & Federspiel, 307 Franklin St., Port Washington, Wisconsin. O-533

For Sale—One 30" Danzer Lightning Edger, \$20.00; one 20" Groover, \$5.00. These tools are as good as new. If interested, Address Haftenkamp Heating Company, 2611 East 34th Street, Kansas City, Missouri. K-533

For Sale—One 10 gauge 50" Belt driven Power Rolls, \$225.00. One 10 gauge No. 10-M Marshalltown Rotary shears, motor attached, \$220.00. Rolls and Rotary shears as good as new. One Large Drill Press, motor attached made by the E. L. Essley Machinery Company, \$100.00. Drill Press is not new but in good shape. Address R-533, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

**MISCELLANEOUS**

For Sale—100 lb. capacity acetylene lighting plant, underground type. New—never used. Also No. 270 International round hot water heating boiler, used. Write for prices. Address A. A. Clendenning, Keota, Iowa. T-531


For Sale—One 26" Canton Furnace Fan, 32 volt motor. Three Sheer Regulators. Will sell at a great sacrifice. Address The Ramey Manufacturing Company, 243 North Fifth Street, Columbus, Ohio. D-532

For Sale—A Gottschalk "Christie" Furnace Cleaner—like new. Only used on one job. Will sell at great sacrifice. Address Jos. Kouhek & Son, 2324 West 22nd Street, Cicero, Illinois. A-533

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*Patented December 23, 1919, No. 1,326,096*

## HYRO UNXLD DAMPER QUADRANT

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*Hyro UNXLD Damper Quadrants have an electro-galvanized finish and are made to fit 3/8" and 1/2" square rods or Hyro Damper Bearings. For large dampers special Hyro Heavy-Duty Damper Quadrants, to fit 5/8", 3/4" and 7/8" square rods, in either black or electro-galvanized finish, are available.*

**HYRO MFG. CO., Inc.**

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